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A

DISSERTATION

ON THE

PHILOSOPHY OF ARISTOTLE.

A DISSERTATION
ON THE
PHILOSOPHY
OF
ARISTOTLE,
IN FOUR BOOKS.

IN WHICH HIS PRINCIPAL PHYSICAL AND METAPHYSICAL DOGMAS ARE UNFOLDED;
AND IT IS SHOWN, FROM INDUBITABLE EVIDENCE, THAT HIS PHILOSOPHY HAS NOT
BEEN ACCURATELY KNOWN SINCE THE DESTRUCTION OF THE GREEKS.
THE INSUFFICIENCY ALSO OF THE PHILOSOPHY THAT HAS
BEEN SUBSTITUTED BY THE MODERNS FOR THAT
OF ARISTOTLE, IS DEMONSTRATED.

BY THOMAS TAYLOR.

JOVE HONOURS ME AND FAVOURS MY DESIGNS.
POPE's HOM. IL. Book 9, v. 717.

Τουτον εγω φαιην αν φιλοσοφιας τυπον εις ανθρωπους ελθειν, επ' ευεργεσιᾳ των τηδε Ψυχων, ΑΝΤΙ ΤΩΝ ΑΓΑΛΜΑΤΩΝ, ΑΝΤΙ ΤΩΝ ΙΕΡΩΝ, ΑΝΤΙ ΤΗΣ ΟΛΗΣ ΑΓΙΣΤΕΙΑΣ ΑΥΤΗΣ, *και σωτηριας αρχηγον τοις γε νυν ανθρωποις, και τοις εισαυθις γενησομενοις.*
PROCL. MS. COMMENT. IN PARMENIDEM.

LONDON:
PRINTED FOR THE AUTHOR, MANOR-PLACE, WALWORTH,
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NO. 7, LEADENHALL-STREET.

1812.

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PREFACE.

AS the first and second books of this Dissertation are scarcely any thing else than a Collection from the volumes of my translation of Aristotle's Works, it is necessary to observe, that my reason for so doing was, that I might benefit as much as possible those who were not purchasers of that translation. For as it consists of nine volumes 4to, and fifty copies only of it were printed, it must unavoidably be confined to a few purchasers. Of the present volume, therefore, a greater number than fifty were printed, in order that those English readers might be in possession of the principal physical and metaphysical dogmas of Aristotle, who by the magnitude of the price, and the paucity of the copies, were prevented from obtaining the translation of the whole of his Works. Conceiving also, that it would be more acceptable to the reader, to present him with these dogmas in their most genuine form, I have given them in the very words of Aristotle himself; and have added the commentaries on them of his best Greek disciples. For I have neither the arrogance to suppose, that any explanations of mine could be sufficient to supersede the elucidations of these excellent men, nor the audacity to destroy Aristotle's very scientific method of philosophizing, by attemping, like the ephemeral writers of the age, to exhibit his doctrines in a form calculated to satisfy the superficial, and captivate the vulgar.

As an apology for the freedom with which I have censured modern writers and modern opinions, I deem it will be sufficient to observe, that

I write not with any view to the applause of the many; that I never was, at present am not, nor ever will be, an hireling writer; that I consider independence both as pertaining to outward circumstances, and inward mental energies, as the first of blessings [1] when properly employed; and that, in the language of Socrates, "bidding farewell to the honours of the multitude, and having my eye solely fixed upon truth, I will endeavour to live in the best manner I am able, and when I die to die so;" which can never be accomplished by him, who is afraid to oppose what he conceives to be false, and averse to defend what he believes to be true.

I have given a catalogue of the books I consulted in composing this volume, and in translating Aristotle, not from motives of ostentation, but partly from conceiving that it may be useful to those who wish to make a similar collection; and partly from gratitude to those writers, (and there are many such in this catalogue,) to whom I have been deeply indebted for information in the course of this very laborious undertaking.

The explanation of certain terms used by Aristotle and his Greek commentators, it is almost needless to observe, was prefixed for the benefit both of the Greek and English student of Aristotle.

And now, having premised thus much, after I have made one observation more, I shall take my leave of the reader for some time at least, as the task to the completion of which I shall next devote myself, is the translation and elucidation of Proclus, On the Timæus and Parmenides of Plato; of his six books On the Theology of Plato; and of the Works of Plotinus[2]. The observation is this, that the translation and elucidation of the whole of Aristotle's writings is a work OF NO COMMON MAGNITUDE: that the author of it is SINGLE[3] IN HIS PURSUITS; that the only view with which it was undertaken was, THE GREATEST GOOD OF OTHERS; the period in which it was begun and finished, BARREN; the country in which it was published, COMMERCIAL; and that the enemies of it are THE WORST OF MEN, but its friend is DIVINITY.

---

[1] On this occasion I quote the following lines of Horace, as applicable to myself—

——— MIHI PARVA RURA—
PARCA NON MENDAX DEDIT, ET MALIGNUM
SPERNERE VULGUS.

CARMIN. Lib. 2, Ode 16.

---

[2] If I live to finish the translation of these invaluable works, but should not be furnished with the means of printing it, I shall deposit it in some public library, for the benefit of posterity.

[3] SOLUS; SED SIC SOL. The author says this not from any arrogant opinion of himself, but with a view to those who are so silly as to think that every kind of singularity is blameable.

A

PANEGYRIC

OF THE

MOST EMINENT INTELLECTUAL

PHILOSOPHERS OF ANTIQUITY.

IN just proportion to the solar ray,
Tho' truth eternal gives the mental day,
Yet of our race most ne'er behold its light,
Fast bound in Matter's cave involv'd in night;
And but a few emerging from her den,
Its brightest splendor can distinctly ken.
This noble few in Greece of old were found,
Whose names mankind with just applause resound.
See! like some god descended from the skies,
PYTHAG'RAS, stands the foremost of the wise;
Celestial beauties in his person shine,
His manners modest, and his life divine.
See! like some oracle, by Heav'n inspir'd,
His breast with more than mortal wisdom fir'd,
While to his harp he sings his former fate,
The soul's transitions, and eternal state.
He far discovered in the realms of mind,
And soar'd from sense with vigor unconfin'd.

See! HERACLITUS quit his rightful throne,
The various follies of mankind to moan;
Mark! how he scorns the multitude impure,
And truths sublime describes in words obscure;
Attentive listen to his fav'rite theme,
That all things flow like some perpetual stream;
And ever-varying without check or stay,
Rise to new life, or gradually decay.
He saw the depths of Matter's dark domain,
Stormy and whirling, like the raging main;
Yet well the realms of intellect he knew,
Where all is lovely, permanent and true;
And certain of the soul's immortal frame,
Obscurely told her lapse, and whence she came.
Next view PARMENIDES, by heav'n inspir'd,
And from th' ignoble multitude retir'd;
Divinely meditate, and sing alone,
In venerable verse the mystic one.
Indignant from the realms of sense he flew,
Corporeal forms receding from his view,
Till leaving Matter's regions far behind,
His piercing sight discern'd the world of mind.
See! great EMPEDOCLES with rapture cry,
"Farewell, a god immortal cannot die."
In verse divine, he sung the wretched fate
Of souls imprison'd in this mortal state;
And man he call'd, (immers'd in Matter's night)
"Heaven's exile, straying from his orb of light."
Next mighty SOCRATES demands my lays,
Whose life and doctrines claim unbounded praise.
He to the theory of the realms of mind,
All his researches and his views confin'd;
And in the world's artificer divine
Saw the fair series of ideas shine

In depths immense of all-prolific light,
Forever vig'rous and forever bright.
See! PLATO next in rank of wisdom stand,
Whose godlike works unbounded praise demand;
Who rose sublime to Truth's immortal plain,
And scorn'd dull Body, and her dark domain.
To GOOD ITSELF he soar'd with eager flight,
Till boundless beauty met his piercing sight.
See him with elegance sublime, unfold
Whate'er was known to men divine of old;
Yet but a few the secret sense can find,
And wond'rous depth of his capacious mind.
Next ARISTOTLE claims our just applause,
Who thought itself confin'd by logic laws;
By gradual steps who teaches how to soar,
And the bright world of intellect explore.
Whose piercing genius with Lyncean view,
Look'd all the ample realms of Science thro',
Saw to what dazzling summits[1] they extend,
And what the darksome barrier[2] where they end.
To these philosophers succeed a race
Of glorious souls adorn'd with ev'ry grace;
All men divine; of ancient Wisdom's train,
And justly call'd by some a golden chain.
See! as the leader of the noble band,
The greatly-wise and good PLOTINUS stand.
Genius sublime! whilst bound in mortal ties,
Thy soul had frequent commerce with the skies;
And oft you loosen'd the lethargic folds
By which th' indignant mind dark matter holds.

---

[1] viz. The divine causes and principles of things which Aristotle calls τα τῃ φυσει φανερωτατα παντων, "things naturally the most bright and manifest of all." And Theophrastus, in the fragment of his Metaphysics, calls them ακρα, *summits*.

[2] viz. Matter.

What depth of thought, what energy is thine!
What rays of intellect in ev'ry line!
The more we fathom thy exalted mind,
A stronger light, a greater depth we find.
Thee too, blest PORPHYRY! my muse shall sing,
Since from the great Plotinus' school you spring;
What holy thoughts thy sacred books contain!
What stores of wisdom from thy works we gain!
Urg'd on by thee, we learn from sense to rise,
To break its fetters, and its charms despise.
Nor shall my muse the just applause decline,
Due to IAMBLICHUS, surnam'd divine:
Who pierc'd the veil which hid in dark disguise
Wisdom's deep mysteries from mortal eyes.
Whose godlike soul an ample mirror seems,
Strongly reflecting mind's unclouded beams:
Or like some sphere capacious, polish'd bright,
Throughout diaphanous and full of light.
Great SYRIANUS next, O muse, resound,
For depth and subtilty of thought renown'd.
Genius acute! th' exalted task was thine
The concord to display of men divine.
And what in fable was by them conceal'd,
Thy piercing mind perspicuously reveal'd.
But greatly eminent above the rest,
PROCLUS, the Coryphæus, stands confest.
Hail, mighty genius! of the human race,
Alike the guide, the glory, and the grace:
Whose volumes, full of genuine science shine
With thoughts magnificent, and truths divine.
Whose periods, too, redundant roll along,
Like some clear stream, majestically strong.
While genius lives, thy num'rous works shall last,
Alike the future wonder as the past.

The great AMMONIUS and DAMASCIUS claim
Our rev'rence next, as men of mighty name;
While yet Philosophy could boast a train
Of souls ally'd to Homer's golden chain.
The former for unfolding truth renown'd,
The latter for his searching mind profound.
PRISCIAN and fam'd OLYMPIODORUS stand
The next in order, and our praise demand,
And with th' acute SIMPLICIUS close the band.
Heroes, all hail! who left your native skies,
From Lethe's realms t' instruct us how to rise,
And thus once more our kindred stars regain,
And ancient seats in Truth's immortal plain,
From whence we wand'ring fell, thro' mad desire
Of Matter's regions, and allotments dire.
Let Folly proudly boast her tyrant reign,
Her num'rous vot'ries, and her wide domain;
Your wisdom scorn, and with barbaric hand
Spread futile theories thro' a venal land.
By you inspir'd, the glorious task be mine
To soar from sensibles to forms divine;
From Phantasy, the souls Calypso, free,
To sail secure on life's tempestuous sea,
Led by your doctrines, like the Pleiads' light,
With guiding radiance streaming thro' the night;
From mighty Neptune's overwhelming ire,
Back to the palace of my lawful sire.

A

CATALOGUE OF BOOKS

WHICH WERE

CONSULTED BY THE AUTHOR IN COMPOSING THIS VOLUME,

AND IN

TRANSLATING THE WORKS OF ARISTOTLE.

A

AGNESI, Donna Maria, Analytical Institutions of, 4to. Lond. 1801. 2 vol.

Agricola de Ortu et Causis Subterraneorum. De Natura eorum quæ effluunt ex terra. De Natura fossilium. De Veteribus et Nobis Metallis, &c. 12mo. Witteberg, 1612.

Alberti Magni opera, fol. Lugdun. 1651. 21 vol.

Alexander Aphrodisiensis in duodecim Aristotelis libros de Prima Philosophia, interprete Joanne Genesio Sepulveda. fol. Venet. 1551.

———— in primum Priorum Analyticorum Aristotelis, Gr. fol. Venet. 1520.

———— in VIII Topicorum libros, Gr. Venet. 1526.

———— in librum Aristotelis de Sensu et iis quæ sub Sensum cadunt. Gr. fol. Venet. 1527.

———— De Anima Gr. fol. Venet. 1534.

Alexandri Quætiones Naturales, Gr. fol. Venet. 1536.

Ammonius in quinque voces Porphyrii.

———— in Aristotelis Predicamenta.

———— in librum Aristotelis de Interpretatione, Gr. 12mo. Venet. 1545.

Anecdota Græca á Villoison. fol. Venet. 1781.

Antiquæ Musicæ Auctores Septem. Gr. et Lat. 4to. à Meibomio. Amstel. 1652.
Archimedis Opera, Gr. et Lat. Oxon. 1792.
Aristotelis omnia quæ extant opera cum Commentariis Averroïs Cordubensis, 8vo. Venet. 1575. 12 vol.
——— opera Gr. et Lat. à Du Val. fol. Paris 1654. 4 vol.
——— opera à Causab. fol. Colon. 1605.
——— —— à Pacio, 8vo. Genev. 1607. 2 vol.
——— Physica et Parva, Naturalia, Gr. à Wechel. 4to. Francof. 1584.
——— Alexandri, et Cassii Problemata, cum Theophrasteorum quorundam collectaneis, Gr. à Wechel, 4to. Francof. 1585.
——— libri tres de Anima, Gr. 4to. à Wechel. Paris, 1549.
——— Organon, Gr. et Lat. fol. à Pacio Francof. 1597.
——— libri X de Moribus ad Nicomachum, Gr. 4to. Paris, 1540.
——— do. Gr. 4to. Paris, 1560.
[N. B. Harwood calls this a beautiful edition.]
——— Physica, Gr. et Lat. à Pacio. 8vo. Hanov. 1608.
——— Rhetorica, Gr. et Lat. 8vo. Oxon. 1805.
——— Ethica, Gr. et Lat. 8vo. à Wilkinson, Oxon. 1803.
——— et Theophrasti Scripta quædam, Gr. 12mo. ex officina Henrici Stephani, 1557.
——— Politicorum, libri octo, Gr. et Lat. fol. à Lambin. et Victor. Basil, 1592.
——— Poetica, Gr. et Lat. 4to. à Tyrwhitt. Oxon. 1794.
——— Historia Animalium, Gr. et Fr. à Camo, 4to. Paris 1783. 2 vol.
——— Rhetorica, Gr. et Lat. 4to. Lond. 1696.
——— Op. Gr. et Lat. à Buhle, 8vo. Bipont. 1701. Vol. 1.
——— Mechanica, Gr. et Lat. 4to. à Monantholio, Paris, 1599.
——— Meteorologicorum libri quatuor, Gr. 4to. Paris à Wechel. 1547.
——— Fragmentum de Audibilibus, Gr. et Lat. (See the 3d Vol. of Wallis's Works, printed at Oxford, 1699.)
——— de Anima libri tres Gr. et Lat. 12mo. à Pacio. Hanov. 1611.
——— de Moribus ad Nicomachum libri decem, Gr. et Lat. 12mo. Basil 1556.
Aristotle's Poctic, translated by Pye, 4to. Lond.
——— Rhetoric, translated by the Authors of the Art of Thinking, 12mo. Lond. 1686.
——— Politics translated by Le Roy, fol. Paris, 1598.
——— Politics, translated by Ellis, 4to. Lond. 1776.
* Accorombonii Felicis, Interpretatio obscuriorum locorum et sententiarum omnium operum Aristotelis, &c. fol. Romæ, 1590.

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* This is the first edition of this valuable work, which is so rare, that the editor of the Bipont edition of Aristotle's works, says that he never saw it.

B

Brerewoodi Tractatus quidam Logici, &c. 12mo. Oxon. 1631.
Butleri Rhetoricæ, libri duo 12mo. Lond. 1621.
Burgersdicii Institutionum Logicarum, libri duo 12mo. Cantab. 1666.
Bullialdus Ismaël de Natura Lucis, 8vo. Paris, 1638.
Baconi Rog. Specul. Mathem. 4to Francof. 1614.
Bacon, Lord, works of, 4to. 1765. 5 vol.
Boethii Arithmetica cum Commentario. Ruffi. fol. Paris, 1521.
——— Dialectica, fol. Venet 1547.
——— Consol. Philos. 8vo. Lugdun. Batav. 1671.
Biographia Britannica, fol. 1747. 7 vol.
Blancanus de Locis in Aristotele Mathematicis, 4to. Bonon. 1615.
Barocii Francisci Commentarius in locum Platonis obscurissimum in principio Dialogi octavi de Repub. de Numero Geometrico, 4to. Bonon. 1566.
Boyle's works, 4to. 1772. 6 vol.
Boerhaave's Elements of Chemistry, 4to. Lond. 1735. 2 vol.
Berkeley's Siris, 8vo. Lond. 1744.
———— Analyst, 8vo. Lond. 1734.
Bonnycastle's Introduction to Astronomy, 8vo. Lond. 1803.
Bridgman's Translation of the Paraphrase of an Anonymous Greek Writer On the Nicomachean Ethics of Aristotle, 4to. Lond. 1807.

C

Casi Joan. Speculum Quæstionum Moralium in Universam Aristotelis Ethicen, 12mo. Francof. 1594.
—— Summa Veterum Interpretum in universam Dialecticam Aristotelis, 12mo. Oxon. 1598.
Conimbricensis Collegii Comment, in libros Physicorum, et in lib. de Cœlo et de Anima Aristotelis, 4to. 1609. 3 vol.
Chaldaic Oracles, Collection of, by Thomas Taylor, in the Monthly Magazine.
Cossandus, Leonard. de Magisterio Antiquorum Philosophorum, 12mo. Genev. 1684.
Cartesii Renati Principia Philosophiæ, 4to. Amstel, 1644.
Corsini Institutiones Philosophiæ, 12mo. Venet. 1743. 3 vol.
Calculus Integralis à Bougainville, 4to. Vindobon. 1764.
Cheyne's Philosophical Principles of Religion, 8vo. London, 1715.
Carnot, On the Theory of the Infinitesimal Calculus. (See the Philosophical Magazine.)
Cleomedis Meteora, Gr. et. Lat. 4to. Burdig. 1605.
Calcagnini Opera, fol. Basil. 1544.
Contareni, Gasparis Cardinalis Opera, fol. Paris. 1571.

D

Digby, Sir Kenelm, of Bodies, and of Man's Soul, 4to. Lond. 1669[*].

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[*] The following encomium on Aristotle in p. 450 of this work, first led me to the study of Aristotle's Philosophy: "As he was the greatest logician and metaphysician and universal scholar, peradventure that ever lived, (and

Dionis, Chrysostomi Opera, Gr. et Lat. fol. Lutet. 1604.

Davy, Dr., Lectures of, in the Philosophical Transactions for 1808, and 1809, and at the Royal Institution.

Damascius *περι αρχων*, *de Principiis*, MS.

E

Eustachii Summa Philosophiæ, 12mo. Lugdun. 1626.

Eustratii et aliorum Peripateticorum Comment. in libros Aristotelis de Moribus ad Nicomachum, Gr. fol. Venet. 1536.

Encyclopedia Britannica, 4to. 1797. 15 vol.

F

Fabricii Bibloth. Græc. 4to. Hamburg. 1708. 14 vol.

Fasciculus Præceptorum Logicorum, 12mo. Oxon. 1633.

Follini Joan. Speculum Naturæ Humanæ, 12mo. Colon. Agrip. 1649.

Friend's History of Physic, 8vo. 1750. 2 vol.

Fabri Jacobi Paraphrases totius Philosophiæ Naturalis, 4to. 1521[*].

G

Golii Theoph. Epitome Doctrinæ Politicæ, ex octo libris Politicorum Aristotelis, 12mo. Argentor. 1614.

Gregory's Elements of Astronomy, 8vo. Lond. 1715. 2 vol.

Gordon's Remarks On the Newtonian Philosophy, 12mo. Lond. 1719.

Gratarolus de Memoria Reparanda[†], augenda, conservandaque, ac de Reminiscentia, et *locali vel artificiosa Memoria*, &c. 12mo. Basil. 1554.

Goclenii Physiognomonica et Chiromantica Speciala, 12mo. Marpurg. 1621.

Hoekeri

(and so highly esteemed, that the good turn which Sylla did the world in saving his works, was thought to recompence his many outrageous cruelties and tyranny,) so his name must never be mentioned among scholars but with reverence, for his unparalleled worth, and with gratitude for the large stock of knowledge he hath enriched us with." What renders this encomium the more remarkable is, that the author of it was at the same time attempting to introduce a philosophy of his own different from that of Aristotle.

[*] This is one of the best and most rare of the elucidations of Aristotle's philosophy in Latin.

[†] This is a very rare and curious treatise. The following extract from the second book On Artificial Memory, will enable the pupils of Professor Von Feinaigle to judge, whether the Professor's method of Mnemonics is the same as that of Gratarolus. Having chosen some large and empty house, and divided it after a certain manner into places, Gratarolus observes: Ista loca debent esse signa memorabilia et manuductibilia, loci enim non sunt anguli, sed fixæ imagines in angulis situatæ: super quibus sicut super charta aliæ pinguntur imagines delebiles, sicut literæ. Ut verbi causa, primus locus signatur per urinale, ponendo in ejus loco urinale. Secundus signabitur per pixidem. Tertius per mortarium. Quartus signabitur per pistillum ponendo illud ibi. Quintus per pugillare, &c.—Transeamus ad imagines, quæ sunt res collocandæ; debent ita imagines nobis notæ in istis locis collocari cum motibus talibus, ut per eas valeamus memorari. Verbi gratia, volo memorari de viginti nominibus, sic faciam: in primo loco imaginem Petri mihi notissimi loca bocum urinali in manu pleno uriná quam fundet super

per

H

Hoekeri Clavis Philosophica, 12mo. Tubing. 1620.
Hispani, Petri Summulæ Logicales, 4to. Venet. 1610.
Hierocles in Aurea Carmina, Gr. et Lat. 8vo. Cantab. 1709.
Hutton's Mathematical Dictionary, 4to. Lond. 1795. 2 vol.
Herschel, Dr. in the Philos. Transac. for 1795, 1808, and 1811.
Heliodori Ethiopica, 8vo. Gr. et Lat. 1596.
Heereboordi Collegium Ethicum seu Philosophia Moralis, 12mo. Lond. 1658.

I

Iamblichus de Mysteriis, &c. Gr. et Lat. fol. Oxon. 1678.
——— in Nicomachi Arithmeticam Introductionem, Gr. et Lat. Arnhem. 1668.
Ioannis ab Indagine Introductiones Apostelesmaticæ in Physiognomiam, &c. 12mo. Argentor. 1630.

K

Kepleri Harmonices Mundi, libri V. fol. Linc. Aust. 1619.

L

Logicæ Artis Compendium, 12mo. Oxon. 1750.
Launojus Joan. de Varia Aristotelis Fortuna in Academia Parisiensi, 4to. Hagæ—Com. 1656.
Liebleri Epitome Philosophiæ Naturalis, 12mo. Basil. 1575.
Luyts Joan. Astronomica Institutio, 4to. Traject ad Rhen. 1692.
Locke's Works, 4to. 1777. 4 vol.
Leonicus Nicol. Comment. in primum librum Aristot. de Animalium partibus, 12mo. Basil. 1559.

M

Magiri Physiologiæ Peripateticæ, libri sex, 12mo. 1629.
Mauri Sylvestri Paraphrasis in Aristot. Op. om 4to. Romæ 1668. 6 vol.
Maurolyci Opuscula Mathematica, 4to. Venet. 1575.
——— Theoremata de Lumine et Umbra, 4to. Lugdun. 1613.
Michaelis Ephesii Annotationes in librum Aristot. de Memoria et Reminiscentia. }
——— de Somno et Vigilia. }

per Jacobum mihi notissimum: et ex isto actu notabili, horum duorum memorabor: et sic duorum nominum memoriam mihi fecero—In secundo loco ponam Martinum mihi notissimum (nam oportet imagines istas esse notissimas, ut cito in memoriam recurrant) qui ponet digitum suum in pyxide et extrahet unguentum, quo cum digito orificium unget ani Henrici mihi notissimi. In tertio ponam Andream mihi itidem notum, qui cum manu ex mortario extrahet emplastrum quod ponet super faciem Francisci, vel alios ridiculos actus fabricando, ex quibus memoria de talibus nominibus confirmetur. Et ita pariformiter procedatur in aliis."

Michaelis de Somniis.
——— de Divinatione per Somnium.
——— de Motu Animalium.
——— de Longitudine et Brevitate Vitæ.
——— de Juventute et Senectute, et Vita ac Morte.
——— de Respiratione.
——— de Gressu Animalium, Gr. fol. Venet. 1527.
——— Scholia in libros Aristotelis de partibus Animalium, Monthesauro interprete, 12mo. Basil. 1559.
Malebranche's Search after Truth, fol. Lond. 1700.
Manilius, by Creech, 8vo. Lond. 1697.
——— à Jos. Scaliger, 12mo. 1580.
Moller Nicolas de Indubio Solis Motu, Immotaque Telluris Quiete, 4to. 1734.
Meursii Denarius Pythagoricus, 4to. Lugdun. Batav. 1631.

N

Newtoni Lectiones Opticæ, 4to. Lond. 1729.
Newton's Fluxions by Colson, 4to. Lond. 1736.
Newton de Mundi Systemate, (in Dr. Horsley's edition of his works.)
Nieuwentiit's Religious Philosopher, 8vo. Lond. 1730. 3 vol.
Nicomachi Gerasini Arithmeticæ, libri duo, Gr. Paris. 1538.

O

Occhami Summa Totius Logicæ, 8vo. Oxon. 1675.
Otthonis Andræ Anthroposcopia, 12mo. 1647.
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Pacii Jul. Institutiones Logicæ, 12mo. Bernæ, 1600.
——— Comment in Aristot. Organon, 4to. 1605,
Platonis opera, Gr. et Lat. fol. à Ficino, Francof. 1602.
——— de Republica, libri X. à Massey, 8vo. Cantab. 1713.
Ptolemæus de Speculis*.
Ptolemæi Planisphærium, 4to. Venet. 1558.

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* This very rare treatise is extant only in a Latin translation at the end of a collection of treatises On the Sphere, fol. Venet. 1518. It consists of two books, and at the end of the 2nd book are the following words: "Explicit secundus et ultimus liber Ptolemæi de Speculis. Completa fuit ejus translatio ultimo Decembris Anno Christi, 1269.

Ptolemæi liber de Annalemmate Romæ, 1652.*
——— Magna Syntaxis, Gr. fol. Basil. 1583.
Ptolemæus de Planetarum Hypothesibus, Gr. et Lat. 4to. à Joh. Bainbridge, Lond. 1620.
Portæ Baptistæ Physiognomonia, 8vo. Francof. 1618.
Physiognomoniæ Sriptores Veteres, Gr. et Lat. 8vo. à Franzio. 1780.
Porphyrii in Aristotelis Categorias expositio per interrogationem et responsionem, Gr. 4to. Paris. 1543.
——— *αφορμαι προς τα νοητα, or, Auxilliaries to the knowledge of Intelligibles,* 12mo. Cantab. 1655.
Philoponus Joan. in Analytica priora Aristotelis. Gr. fol. Venet. 1536.
——— in Analytica posteriora, Gr. fol. Venet. 1504.
——— in librum primum Meteorum, Gr. fol. Venet. 1551.
——— in libros tres de Anima, Gr. fol. Venet. 1535.
——— Contra Proclum de Mundi æternitate, Gr. fol. Venet. 1535.
Proclus in Timæum Platonis, Gr. fol. Basil. 1556.
——— de Motu, Gr. 12mo. Basil. 1531.
——— in Theologiam Platonis, Gr. et Lat. fol. Hamburg. 1618.
——— in Euclidem, Gr. fol. Basil. 1533.
——— in Parmenidem Platonis, MS.
Procli Hypotoposis Astronom. Posit. Gr. 4to. Basil. 1540.
Plotini Opera, Gr. et Lat. fol. Basil. 1590.
Pici Joh. Mirandul. op. fol. Basil. 1573.
Pearson, Dr. George, (in No. 142 of Nicholson's Journal.)
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R

Renaudotus de Barbaricis Aristotelis librorum versionibus. vid. Fabric. Biblioth. Græc. Tom. 12, p. 246.
Ross, Alexander de Terræ Motu Circulari, 4to. Lond. 1634.
Ray's Wisdom of God in the Creation, 12mo. 1692.
Reflections on Ancient and Modern Philosophy, 12mo. Lond. 1686.
Ronayne's Algebra, 8vo. Lond. 1727.

S

Sennerti Epitome Naturalis Scientiæ, 12mo. Oxon. 1664.
Specimina Philosophiæ Veteris per Abrah. Gravium, 12mo. 1673.
Schegkii Philosophiæ Naturalis omnes disputationes, &c. 12mo. Tubing. 1538.
Sandersoni Logicæ Artis Compendium, 12mo. Oxon. 1741.
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——— in octo libros Physicæ ακροασεως, Gr. fol. Venet. 1526.

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* This treatise is so rare, that Fabricius in his Biblioth. Græc. vol. 3. p. 449. says of it, "Hunc librum nondum vidi.

Simplicius, in libros III. de Anima, Gr. fol. Venet. 1527.
——— in libros IV. de Cœlo, Gr. fol. Venet. 1526.
——— in quatuor libros de Cœlo, Guillermo Morbeto Interprete, fol. Venet. 1540 *.
Simplicii Commentarius in Enchiridion Epicteti, Gr. et Lat. 4to. Lugd. 1640.
Syrianus in II, XII, et XIII, Aristotelis libros Metaphysices †, 4to. Venet. 1558.
Synesii opera, Gr. et Lat. fol. à Petavio Lutet. 1631.
Scriptor. Logarith. 4to. Vol. 3, Lond. 1796.
Saunderson's Algebra, 4to. Cam. 1741. 2 vol.
Sturmius's Elements of the Mathematics, 8vo. Lond. 1700.

T

Themistii Paraphrasis librorum Aristotelis, Gr. fol. Venet. 1534.
——— Paraphrasis in duodecimum librum Aristotelis de Prima Philosophia, Moze Finzio interprete, fol. Venet. 1576.
——— Paraphrasis in libros quatuor Aristotelis de Cœlo, Moyse Alatino Hebræo Spoletino interprete, fol. Venet. 1574.
Theophrasti Metaphysicorum fragmentum, Gr. fol. Venet. 1498.

V

Velcurionis Commentarii in Universam Physicam Aristotelis, 12mo. Colon. 1572.
Vossii Rhetorices Contractæ, sive Partitionum Oratoriarum, libri 5. 12mo. Oxon. 1631.
Vossius de Logices et Rhetoricæ Natura et Constitutione, 4to. Hag. Com. 1658.

U

Uranologion, Gr. et Lat. fol. à Petavio Lutet. Paris. 1630.

W

Wallisii Arithmetica Infinitorum, 4to. Oxon. 1656.
Wallis's Algebra, fol. Lond. 1785.

Z

Zabarellæ Jac. Opera Logica, 4to. Colon. 1597.
——— Commentarii in Aristotelis libros de Anima, 4to. Francof. 1606.

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* This translation enabled me in many places to correct the Greek edition of Aldus. The following instance of its utility for this purpose is very remarkable. Simplicius, according to the Greek text, says, "he has heard that the Egyptians have in their writings observations of the stars for not less than *two thousand years*;" (ουκ ελαττονων ἢ δισχιλιων ενιαυτων) But the translation of Morbetus has, "*Non paucioribus quam à quinque millibus annorum*," i. e. *for not les than five thousand years*, which is doubtless the true reading.

† This most excellent Commentary is only extant in print i this translation by Bagolinus; and the translation is uncommonly bad. My copy, however, was once in the possession of the learned Thomas Gale, who has every where corrected the translation from the original Greek MS.

AN EXPLANATION

OF

CERTAIN TERMS

USED BY

ARISTOTLE, AND HIS GREEK COMMENTATORS.

ACROAMATIC and SYNTAGMATIC DOCTRINES, are docrines which require greater study than others.

το αΐδιον, THE PERPETUAL. Is that which subsists always, but is connected with the three parts of time, the past, present, and future. Hence, the fabricator of the world is *eternal,* but the world is *perpetual.*

το αιωνιον, THE ETERNAL. Is that which has a never ending subsistence, without any connection with time. For eternity as it is profoundly defined by Plotinus, is infinite life, the whole of which is at once present, without any thing belonging to it being consumed, and in which there is neither past nor future*. *και ει τις ουτως τον αιωνα λεγοι, ζωην απειρον ηδη τῳ πασαν ειναι, και μηδεν αναλισκειν αυτης, το μη παρεληλυθεναι, μη δ᾽ αυ μελλειν, ηδη γαρ ουκ αν ειη πασα· εγγυς αν ειη του οριζεσθαι.* Plotin. Ennead. 3, lib. 7, p. 329.

αιτια, CAUSES. There are sixty-four modes of causes according to Aristotle. For every cause is either essential or accidental; and these subsist in a twofold respect. For they subsist either proximately or remotely; and thus produce four modes. All these again have a twofold subsistence; for they are either simple or complex; and thus they produce eight modes. These again, have a twofold subsistence; for they are either in energy, or in capacity; and consequently produce sixteen modes. And because causes are denominated in a fourfold respect; for they are either material, or formal, or efficient, or final; hence there are in all sixty-four modes.

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* Boethius in the 5th book of his treatise De Consolatione Philosophiæ, has adopted this definition of eternity. For he says: "Æternitas igitur, interminabilis vitæ tota simul et perfecta possessio." i. e. *Eternity is the at-once total and perfect possession of boundless life.* But none of his commentators appear to have known that he derived it from Plotinus.

αλλοιωσις, ALLIATION. Change in quality.

το αμεθεκτον, THE IMPARTICIPABLE. One thing is said to be imparticipable with respect to another, to which it is superior, when it is not consubsistent with it.

γενεσις, GENERATION. Is *universally* the whole of a visible nature, as opposed to an incorporeal and invisible nature. It also *particularly* denotes the sublunary region.

το γιγνεσθαι. Signifies an extension in subsistence, or a tendency to being, and not *merely* a subsistence, which the words *το ειναι*, and *το ον*, denote.

διανοια, DIANOIA. Is *διεξοδικη του λογου ενεργεια*, i. e. *the discursive energy of reason;* or it is that power of the soul which reasons scientifically, deriving the principles of its reasoning from intellect.

δοξα, OPINION. Is the last of the gnostic powers of the rational soul; and knows *that* a thing is, but is ignorant of the cause of it, or *why* it is. The knowledge of the *διοτι*, or *why* a thing is, being the province of dianoia.

δημιουργος των ολων, THE DEMIURGUS OF WHOLES. The artificer of the universe is thus denominated, because he produces the universe so far as it is a *whole*, and likewise all the *wholes* it contains, by his own immediate energy; other subordinate powers co-operating with him in the production of parts. Hence, he produces the universe *totally* and *at once*.

δοκησις, SUSPICION, or *a doubtful perception of a thing*. Suidas very properly classes a perception of this kind, with that of a phantasm, a dream, and a shadow.

δι ὁ, ON ACCOUNT OF WHICH. The final cause is thus denominated.

δυναμις, CAPACITY. Is a perfect preparation of essence, and an unimpeded promptitude to energize, prolific of energy.

δι ου, THROUGH WHICH. The instrumental cause is thus denominated.

ειδησις, SCIENTIFIC KNOWLEDGE.

ειδος, FORM. Is the internal characteristic of a thing, and subsists according to *λογος*, considered as a productive principle, which see.

ενεργεια, IN ENERGY. A subsistence in energy is twofold. For it is either as a whole *subsisting* that which it is, as a man or a house; or as that which has its being in *a tendency to existence*, or *in becoming to be*, as a contest and a day; for we say that these are in energy when they are.

εξ ου, or *εν ῳ*, FROM WHICH, or IN WHICH. This expression denotes the material cause.

το ενιαιον, THE UNICAL. That which is characterized by unity.

εντελεχεια, ENTELECHEIA. Is the possession of perfection; and when it is properly asserted of energy, is not asserted of casual energy, but of that which is perfect, and is established according to a subsistence in energy.

επιθυμια, DESIRE. Is an irrational appetite solely directed to external objects, and to the gratification arising from the possession of them.

εφεσις, Ephesis. Is the tendency of inanimate natures to their proper good.

θυμος, Anger. An appetite directed to the avengement of incidental molestations.

καθ' αυτο, Essentially, or per se.

καθ' ο, According to which. Form is thus denominated.

κινημα, The boundary of motion. In the same manner as an instant is the boundary of time.

λογος. This word in Aristotle, not only signifies a word, a sentence, and an oration, but also *computation* in calculations and reckoning; that inward discursive energy called *reasoning; a certain productive and seminal principle;* and *that which is indicative and definitive of a thing*. Hence, λογοι, in the soul, are, gnostically producing, principles.

μονας, Monad. In divine natures is that which contains *distinct*, but at the same time *profoundly-united* multitude, and which produces a multitude exquisitely allied to itself. But in the sensible universe, the first monad is the world itself, which comprehends in itself all the multitude of which it is the cause (in conjunction with the cause of all). The second monad is the inerratic sphere. In the third place the spheres of the planets succeed, each of which is also a monad, comprehending an appropriate multitude. And in the fourth and last place are the spheres of the elements, which are in a similar manner monads. All these monads, likewise, are denominated, ολοτητες, *wholenesses*, and have a perpetual subsistence.

μορφη, Morphe. Pertains to the colour, figure, and magnitude of superficies.

μη ον, Non-being. Is either that which is false, in the same manner as *being* is that which is true; or it is that which in no respect is; or that which in capacity is not.

νοερα επιβολη, Intellectual projection. The immediate energy of intellect is thus denominated, because it is an intuitive perception, or an immediate darting forth, as it were, to its proper object, the intelligible.

νους, Intellect. Is the summit of dianoia, and is that power by the light proceeding from which we perceive the truth of axioms.

οιησις, Distorted opinion.

ολον προ των μερων, A whole prior to parts. Whole has a triple subsistence. For it is either prior to parts; or it consists of parts; or it is in a part. The first of these is the cause of the parts it contains; just as a divine intellect is the cause of all the multitude of ideas it contains. The second is a whole *essentially*. And the third is a whole according to *participation*.

το οπερ ον, That which is being. This expression with Aristole, is the same thing as with Plato, το αυτο ον, or *being itself*.

ορμη, Orme. An internal principle of motion.

ορεξις, Orexis, Appetite. What *orexis* is in animated, that *ephesis* is in physical inanimate natures.

παθη, Passive qualities.

ποιοτης, Quality. Is that which imparts what is apparent in matter, and what is the object of sense.

ποροι, PORES. The more easily passive parts of bodies. For Aristotle does not admit the existence of void spaces.

προαιρεσις, PRE-ELECTION, i. e. DELIBERATE CHOICE.

προσεκτικη της ψυχης δυναμις, THE ATTENTIVE POWER OF THE SOUL. This power investigates and perceives whatever is transacted in man; and says, I understand, I think, I opine, I am angry, I desire. This attentive part of the soul, also, passes through all the rational, irrational, and vegetable or physical powers. In short, this power is *the one* of the soul, which follows all the other powers and energizes together with them. For we should not be able to know all these, and to apprehend in what they differ from each other, unless we contained *a certain indivisible nature*, which has a subsistence above the common sense, and which prior to opinion, desire, and will, knows all that these know and desire, according to an *indivisible* mode of apprehension.

προς ο, WITH RELATION TO WHICH. The paradigmatic cause is thus denominated.

στασις, PERMANENCY. The proper word for rest, in Greek, is *ηρεμια*. And Simplicius justly observes, that not every *στασις* is *ηρεμια*, but that only which is after motion. This word is also employed by Plato in the Sophista, to express one of the five genera of being, viz. *essence, permanency*, (*στασις*) *motion, sameness*, and *difference*; in which place it evidently does not signify rest.

το ισταμενον. Is equivalent to be about to stand still, or to a tendency to rest.

τα συνθετα σωματα, COMPOSITE BODIES. I have used the word *composite* instead of *compounded*, because the latter rather denotes the mingling, than the contiguous union of one thing with another, which the former, through its derivation from the Latin word *compositus*, solely denotes.

το τι ην ειναι. THE VERY NATURE OF A THING.

υπεκκαυμα. INFLAMMABLE MATTER AT THE SUMMIT OF THE AIR.

υπαρξις. The first principle, or foundation, as it were, of the essence of a thing. Hence, also, it is the summit of essence.

υποληψις, HYPOLEPSIS. As dianoia, or the discursive energy of reason, subsists according to terms or boundaries, and is not continued like a physical transition, *the assent and affirmation of the soul according to each boundary, as in one limit, or the assent of the soul to it as true, is hypolepsis*. In other words, hypolepsis is the assent of the soul to each proposition of a syllogism.

υφ' ου, BY WHICH. The demiurgic or fabricative cause is thus denominated.

φαντασια, THE PHANTASY, or IMAGINATION, is, *μορφωτικη νοησις*, i. e. *a figured intelligence*, because all the perceptions of this power are *inward*, and not external, like those of sense, and are *accompanied with figure*.

φορα. LATION, i. e. LOCAL MOTION.

ψυχικος. PSYCHICAL, i. e. PERTAINING TO SOUL, in the same manner as *φυσικος*, *physical*, is *something pertaining to nature*.

THE FOLLOWING IS

A LIST OF TRANSLATIONS, AND ORIGINAL WORKS,

BY THE AUTHOR.

TRANSLATIONS.

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THE Hymns of Orpheus. 12mo.

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A new Edition of Hederic's Greek Lexicon, in which many Words are inserted, not found in other modern Lexicons, and an Explanation is given of some Words agreeably to the Platonic Philosophy. 4to. 1803.

The Elements of the true Arithmetic of Infinites, in which all the Propositions in the Arithmetic of Infinites invented by Dr. Wallis, relative to the summation of infinite series, and also the principles of the doctrine of fluxions, are demonstrated to be false; and the nature of infinitesimals is unfolded, 4to.

A
DISSERTATION
ON THE
PHILOSOPHY OF ARISTOTLE.

BOOK I.

CHAPTER I.

AMONG the prodigies of genius who have largely benefited mankind by disseminating philosophy, Aristotle maintains a very distinguished rank. When we consider that he was not only well acquainted with every science, as his works abundantly evince, but that he wrote on almost every subject which is comprehended in the circle of human knowledge, and this with the most consummate accuracy and skill, we know not which to admire most, the penetration or extent of his mind. For capacious indeed must that mind have been which embraced the vast orb of existence, and left nothing unexplored in the heavens or the earth, and penetrating that genius which arrived at the luminous boundaries of human knowledge, and rendered them accessible to others. With a bold, yet not impious hand, he appears to have withdrawn the awful veil of Nature herself, to have detected her most secret mysteries, and ranged through every part of her variegated dominions. In short, he seems to have possessed, and to have exercised the power of reasoning in the greatest perfection possible to man; and such of his works as have escaped the ravages of time, will ever be considered by the genuine lovers of science, as treasures which from their singular excellence are destined to perish in no less a catastrophe than that of a deluge or conflagration.

To unfold the principal dogmas of the philosophy of this sublime genius; to prove that his philosophy has not been understood since the destruction of the schools of the Philosophers by the Emperor Justinian; and to detect and expose the fallacy and nothingness of what has been called philosophy since the time of the Greeks, is the design of the present Dissertation.

As preparatory however to the developement of his principal dogmas, it will be requisite to present the reader with a division of his works; to show what the end is of his philosophy, and which of his writings lead us to this end: what kind of diction he employs; why he designedly wrote with such obscurity; and to evince that his principal doctrines are conformable to those of Plato, and that he differs from his divine master in appearance only, and not in reality.

Of his remaining works, therefore, some are theoretic, others practical, and others instrumental. Likewise of those treatises which are entirely theoretic or contemplative, some are theological, as his Metaphysics; others physical, as his eight books inscribed Physical Ausculation; and the books consequent to these, such as those On the Heavens, On Generation and Corruption, &c.; and others again are mathematical, such as his Mechanical Problems, and his treatise On Indivisible Lines. In like manner with respect to his practical writings, some are moral, as his Nicomachean and Eudemian Ethics, and those which are inscribed the Great Morals; or they are economical and political, as the treatises which are thus inscribed. Lastly, of the books which are called instrumental, some are on the art of demonstration, as his Posterior Analytics, others respecting things which precede a knowledge of the demonstrative syllogism, as his Prior Analytics, his treatise On Interpretation, and his Categories; and others again are respecting things which often become the subject of demonstration, or are subservient to it, such as his Topics, his Sophistical Elenchi, (or sophistical syllogisms of contradiction), and his books On the Art of Rhetoric. And such is the summary and universal division of the writings of Aristotle.

In the second place, the end of Aristotle's moral philosophy is perfection through the virtues, and the end of his contemplative Philosophy, an union with the one principle of all things: for he scientifically knew and unfolded this principle, as is evident from the 12th book of his Metaphysics, in which he clearly pronounces that the domination of many is not good. The common end, however, both of his moral and contemplative philosophy, which man ought to pursue, is the last and most perfect felicity of which our nature is capable: and at the end of his Nicomachean Ethics he testifies that he who arrives at this felicity ought not to be called a man, but a god. All the works of the Philosopher lead us to the attainment of this end. For some of them unfold to us the art of demonstration; others that we may become virtuous, instruct us in morals; and lastly, others lead us to the knowledge of natural things, and afterwards to those luminous beings, which have a supernatural subsistence.

In the third place, with respect to his diction, it is of that kind that the words may adhere to the sense and the sense to the words; a mode of writing both intellectual, and admirably adapted to the profundity of his conceptions. For he either immediately gives a solution to a doubt, or, connecting many doubts, he briefly solves all of them by one and the same solution. He is likewise never willing to deviate from evidence, which being produced either by intellect or sense, he especially adduces and celebrates the latter when he disputes with those who in every thing consider sense as the standard of truth. Hence, there is such an irresistible strength in his demonstrations, that when he cannot persuade by assumptions not rashly introduced, he at least procures assent by the force of necessity.

This,

This, too, is peculiar to Aristotle, that he was never willing to depart from nature, but even contemplated things which transcend nature through a natural habit and knowledge; just as, on the contrary, the divine Plato, after the manner of the Pythagoreans, contemplated whatever is natural, so far as it partakes of that which is divine and above nature. Hence the former considered theology physically, and the latter physics theologically. He likewise never employs fables and enigmas, and never ascends into the marvellous and the mystic, but adopts obscurity of diction as a substitute for every other veil, and involved mode of writing; the reason of which we proposed to investigate, as the fourth object of inquiry.

Those more antient than Aristotle, thinking that it was not fit to expose their wisdom to the multitudes, instead of clear and explicit diction, adopted fables and enigmas, metaphors and similitudes; and under these as veils, concealed it from the profane and vulgar eye. But the Stagirite praises, and employs obscurity of diction, [1] and perhaps

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[1] That Aristotle was designedly obscure in his acroamatic or more abstruse writings, is evident from the following extract from the Commentary of Simplicius on the Physics of Aristotle, fol. 2.

Διχη δε διηρημενων αυτου των συγγραμματων, εις τε τα εξωτερικα, οια τα ιστορικα, και τα διαλογικα, και ολως τα μη ακρας ακριβειας φροντιζοντα, και εις τα ακροαματικα, ων και αυτη εστιν η πραγματεια, εν τοις ακροαματικοις ασαφειαν επιτηδευσε, δια ταυτης τους ραθυμοτερους αποκρουομενος, ως παρ' εκεινης (lege *ωσπερ εκεινοις*) *μη δε γεγραφθαι δοκειν. Τοι γαρ ουν Αλεξανδρου μετα την Περσων καθαιρεσιν ταδε προς αυτον γεγραφοτος. Αλεξανδρος Αριστοτελει ευπραττειν. ουκ ορθως εποιησας εκδους τους ακροαματικους των λογων. τινι γαρ ετι διοισομεν ημεις των αλλων, ει καθ' ους επαιδευθημεν λογους, ουτοι παντων εσονται κοινοι; εγω δε βουλοιμην αν ταις περι τα αριστα εμπειριαις ἢ ταις δυναμεσι διαφερειν. αυτος ταδε αντεγραψεν. Αριστοτελης βασιλει Αλεξανδρῳ ευπραττειν. εγραψας μοι περι των ακροαματικων λογων, οιομενος δειν αυτους φυλαττειν εν απορρητοις. ισθι ουν αυτους και εκδεδομενους και μη εκδεδομενους. συνετοι γαρ εισι μονοις τοις ημων ακουσασιν. ερρωσο.* i. e. "The writings of Aristotle receiving a twofold division, into the exoteric, such as the historical, and those composed in the form of dialogue; and, in short, those which do not pay attention to extreme accuracy, and into the acroamatic, to which class the present treatise belongs—this being the case, in his acroamatic writings, he studies obscurity, through this deterring the more indolent, as if their very appearance evinced they were not written for them. Alexander, then, after the subversion of Persia, wrote to him as follows:—Alexander wishing prosperity to Aristotle. You have not done right in publishing your acroamatic works: for in what shall we surpass others, if the doctrines in which we were instructed become common to all men? I indeed would rather excell others haps accuses and avoids philosophical fables and enigmas, because some interpretation may be given of them by any one, though their real meaning is obvious but to a few. Perhaps too, he was of opinion that such obscurity of diction is better calculated to exercise the mind of the reader, to excite sagacity, and produce accurate attention. Certain indeed it is, that the present fashionable mode of writing, in which every author endeavours to adapt every subject to the apprehension of the meanest capacity, has debilitated the understanding of readers in general, has subjected works of profound erudition, to contempt, merely because they are not immediately obvious, and, as if the highest truths were on a level with the fictions of romance, has rendered investigation disgusting whenever it is abstruse. That this obscurity, however, in the writings of Aristotle does not arise from imbecility, will be obvious to those who are but moderately skilled in rhetoric. For such is the wonderful compression, such the pregnant brevity of his diction, that entire sentences are frequently comprised in a few words; and he condenses in a line what Cicero would dilate into a page. His books On Meteors, his Topics, and his Politics, likewise evince that he was capable of writing with perspicuity as well as precision; and among his lost works, Simplicius informs us, that his Epistles and Dialogues were most elegantly written. Indeed, says he, none even of the most illustrious writers is equal to Aristotle in Epistolary composition.

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others in the knowledge of the most excellent things than in power. To this Aristotle returned the following answer:—Aristotle to king Alexander, wishing prosperity. You wrote to me concerning my acroamatic works, thinking that they ought not to have been divulged. Know, therefore, that they are published and not published; for they can be understood by my auditors alone. Farewell." Simplicius adds, that, according to Plutarch, this letter of Alexander refers to the Metaphysics of Aristotle.

Conformably to this, also, Simplicius in the Preface to his Commentary on the Categories, observes: *ουδε μυθοις, ουδε συμβολικοις αινιγμασι ως των προ αυτου τινες εχρησαντο, αλλ' αντι παντος αλλου περιπετασματος την σαφειαν* (lege *ασαφειαν*) *προετιμησε.* i. e. "Aristotle neither employed fables nor enigmas like some philosophers before him, but preferred obscurity to every other veil."

principal

In order to show, fifthly, that Aristotle accords with Plato in the principal dogmas of his philosophy, I shall adduce, in the first place, what he says at the end of his Physics, where he terminates the doctrine concerning natural principles in supernatural theology, as in a summit; and evinces that the whole of a natural and corporeal composition, is suspended from an incorporeal and intellectual goodness, which is above nature, and without any habitude to inferior beings. Having, therefore, demonstrated of the first mover that he is one, immoveable, and without parts, he mentions as follows the third of these positions: "These things therefore being determined, it is evident that it is impossible for that which first moves and is immoveable, to have any magnitude. For if it possessed magnitude, it is necessary that it should either be finite or infinite. But that it is impossible there should be an infinite magnitude, has been before demonstrated in the Physics. And that a finite magnitude cannot have an infinite power, and that it is impossible for any thing to be moved in an infinite time by that which is finite, has been just now demonstrated. But the first mover produces a perpetual motion, and in an infinite time. It is evident, therefore, that he is indivisible, without parts, and has no magnitude."

Simplicius justly observes, that Aristotle in what is here said by him accords with Plato. But, he adds, Plato discovers the intellectual God, the artificer of the world, from the essence itself of the mundane body: for separating true Being from that which is generated, he defines the former by a perpetual and invariable sameness of subsistence, as being allotted an essence, the whole of which is established at once and together, without interval, and impartibly in eternity; but asserts that the latter has its subsistence in becoming to be, or rising into existence, as being changed and moved, and having its existence co-extended with the circulations of time. On this account also it is suspended from its cause as incapable of being self-subsistent: for it is perfectly impossible, says he, that it should be generated without a cause. But the cause of that which is generated is true being, lest admitting that there is something generated prior to that which is generated, we should proceed to infinity; and for the same reason, the immutable is the cause of that which is mutable. Plato, therefore, in the Timæus, discovers the demiurgus of the world, who is truly an intellectual God, and is always established in eternity, with an invariable sameness of subsistence; recurring from the mutable essence of the world to its immutable cause. But Aristotle, from the motion and mutation, and the divisible and finite subsistence of bodies, ascends to an immoveable, immutable, and indivisible cause: for he demonstrates that it is necessary there should be a perpetual motion in beings, and consequently that there should be something which is perpetually moved, since motion is in that which is moved. He also demonstrates that every thing which is moved, is moved by something, and that the first mover is necessary immoveable, and the immutable cause of perpetual motion, to the natures which are proximately moved by it. But that *generation* with Plato, and *motion* with Aristotle, signify *mutation*, we may easily learn from this, that Plato divides that which is generated, as being changed, oppositely to that which possesses an invariable sameness of subsistence; but that Aristotle when he says, every thing which is moved, is moved by something, speaks not only about things which are properly moved, but also about such as are generated and corrupted, and in short such as are changed. In many places also he says, that the immoveable is immutable; for it not only surpasses motion properly so called, but also generation and corruption. But it appears to me, that this wonderful man clearly refuses to apply the term *generation* to things perpetual; because the phantasy easily supposes that things which are said to be generated, have a temporal beginning. And in this manner, indeed, the multitude are affected, not being able to co-extend their conceptions with perpetual fabrications; but adding a temporal beginning to that which is said to subsist from a cause, and to be generated. They also appear to understand with facility, if any one supposes a beginning, middle, and end, of the fabrication of things. The greater part of the wise too, looking to that which may be easily understood by their readers, in this manner fabricate the world, asserting that things first, second, and third were generated. And perhaps these wise men think they may be pardoned in so doing, since theologists also do not refuse thus to unfold the generations of the gods, adapting their conceptions to the capacity of their readers. But Aristotle perceiving, as it appears, that the multitude always erroneously understand such assertions, and conceive at the same time a temporal beginning, could not endure to speak of the world as being made; and clearly refuses to call things perpetual generated. Hence he uses the word *motion*, which signifies the same thing as *generation*, but does not require a temporal beginning. Indeed, that he does not refuse the term *generated*, when applied to things which have their being to infinity, is evident from the third book of the Physics, when speaking of the infinite, he says, "Since to be is multifariously predicated, as a day and a contest, in consequence of another and another being always *generated*, so likewise the infinite." The beginning of the demonstration, therefore, is with both philosophers the same, leading from the mutable to the immutable. But afterwards, the one says that every thing which is moved, is moved by something; and the other, that whatever is generated, has its generation from a cause. And the one demonstrates that the first mover is immovable, immutable, and without parts; but the other, that the cause of that which is generated is true being. That however which is without parts, the whole of which is at once, and which possesses an invariable sameness of subsistence, is a thing of this kind; and which, indeed, the being perfectly immutable signifies.

Since, however, some are of opinion, that Aristotle asserts the first mover, whom he celebrates as intellect, eternity, and God, to be alone the final, but not the producing cause of the world, and especially of the heavens, which he frequently says are perpetual, and on this account unbegotten, and that he moves as the desirable, it will be well to show that in this also he accords with his preceptor, who asserts divinity not only to be the final, but also the producing cause of the heavens, and of the whole world. Plato then, in the Timæus, when he says, "Let us relate through what cause the composing artificer constituted generation and this universe; he was good, &c." evidently asserts divinity to be both the final and producing cause of the world. Also when he says, "Placing intellect in soul, and soul in body, he fabricated the universe, that it might be the most beautiful, and the most excellent work according to nature;" and nearly through the whole dialogue, he celebrates the demiurgus, as looking to good. In the speech also of the demiurgus to the celestial gods, he clearly shows that the demiurgus himself proximately produces celestial natures, but sublunary through the celestial. For the first demiurgus says to the junior, or celestial gods, "Gods of gods, of whom I am the demiurgus and father." And in the course of his speech, he adds, "Three genera of mortals remain: but these not being generated, the heaven will be imperfect;" now calling the world *heaven*, in the same manner as Aristotle. He proceeds, "But it is necessary that these should be generated, if the world is to be sufficiently perfect. These, however, being generated by me, and participating of life, will become equal to the gods. In order, therefore, that mortal natures may exist, and that this universe may be truly all, convert yourselves according to nature, to the fabrication of animals." But the words, "These however being generated by me," manifest that if they were generated by a cause which possesses an invariable sameness of subsistence, or as Aristotle would say, by an immoveable cause, they would necessarily be perpetual. And that Aristotle indeed asserts, that God or the first mover is the final cause of the world, is doubted by no one. That he also admits him to be the producing cause appears to be sufficiently evident from his asserting in the division of causes in the second book of the Physics, *the producing cause to be that whence the principle of motion is derived.* Again, he says, "it is that whence the first principle of mutation or rest originates. Thus he who consults is a cause of this kind, and a father of his child; and in short the maker of that which is made." What assertions, therefore, can more perspicuously manifest than these that the first mover is a producing cause? In the first book of his treatise On the Heaven, he clearly says, "that neither God nor nature *make* any thing in vain." And in the same book he says, "that eternity derives its appellation from subsisting always, being immortal and divine; whence also being and life are imparted to other things, to some more accurately, and to others more obscurely." But it is evident, that as all things partake of good through the final cause, so likewise they are and live through the demiurgic cause. In his first book too, On Generation and Corruption, he evinces that the first mover is a producing cause, when investigating the causes of perpetual generation, he thus writes: "But there being one cause whence we say the principle of motion is derived" (and this as we have before observed is according to Aristotle a producing cause) "and matter also being one cause, the former must be said to be a cause of this kind. For of this cause there is one such cause immoveable, through the whole of time, and another which is perpetually moved." Aristotle, therefore, asserts, that the producing cause is twofold: the one immoveable, which is the cause of all things; but the other perpetually moved, (or the celestial orbs,) which is the cause of sublunary natures. In the first book likewise of his Metaphysics, praising Anaxagoras, and prior to him Hermotimus, as not only assigning the material causes of the universe, but also beholding intellect as the producing and final cause, he thus writes: "He therefore who asserted, that as in animals, so also in nature, intellect is the cause both of the world, and of all order, will appear like one sober, when compared with those antients that spoke rashly." Having observed, therefore, that Anaxagoras, and prior to him Hermotimus, mentioned a cause of this kind, he adds, "those therefore who entertained this opinion, together with establishing a principle of things, which is the cause of their subsisting in a beautiful manner, established also a principle which is the cause of motion to things." Hence, he praises those who admitted intellect to be a final and producing cause; just as a little before he praised Anaxagoras, because asserting intellect to be the principle of motion, he preserved it impassive and unmingled[3].

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[3] Simplicius informs us, that his preceptor, the celebrated Ammonius Hermæus, wrote a book to prove, that Aristotle considered God to be the producing cause of the world. From this work, which is unfortunately lost, some of the above observations of Simplicius are derived.

If some one, however, should enquire, why Aristotle does not so evidently assert God to be the producing, as he does that he is the final cause of the world, in answer to this, what was before said concerning a generated nature, must now be repeated. For since that which makes, makes that which is generated, and that which is generated, appears to co-introduce a temporal beginning of generation, on this account Aristotle refuses even to call perpetual bodies *generated*, though he frequently and clearly denominates the cause of them, a producing cause. And, perhaps, if it should be said, that the terms *generated*, and *to make*, are properly adapted to things in generation and corruption, which co-introduce a partial time, other appellations are to be used, in speaking of perpetual natures. And we may observe, indeed, that Aristotle does not refuse to call motion perpetual, though motion has its being *in becoming to be*, or in *rising into existence;* but he does not choose to assert of it *perpetual generation*; because that which is generated appears to be generated, not existing before, and again tends to corruption.

In the next place, it is requisite to observe, that though Aristotle with such apparent violence opposes Plato's doctrine of ideas, yet he in reality accords with this doctrine. For that he was not an enemy to the dogma, that in the intellect of the fabricator of all things there are forms or ideas, which pre-subsist as paradigms, and as the productive principles of whatever has a perpetual subsistence in the universe, is evident from hence, that in the twelfth book of the Metaphysics, he asserts that there is a twofold order, one in the world, and another in the cause of the world, just as we say that there is one order in an army, and another in the commander of the army [1]. But where there is order there must necessarily be separation, and things which are orderly disposed. If any one, however, defines the order which is in the universe, this order cannot certainly accord with that which is in the intellect of the Demiurgus, and consequently the appellation of the one must be discordant with that of the other. Aristotle, therefore, not enduring those conceptions of ideas, which together with sensible appellations introduce definitions that comprehend in themselves a physical and material nature, refuses to call the causes of man and horse, *man itself* and *horse itself*, but is not averse to the first cause being called by purer names, such as *good*, *essence*, *life*, *intellect*, and *energy*. If then it should be said that these subsist in the divine intellect, but that they are not such as those which the sensible region contains, it may reasonably be contended that the same assertion may be made respecting man and horse, and every thing else of a similar kind. Aristotle, therefore, was in general averse to causes receiving the same appellations with their sensible effects; and this was the peculiarity of his philosophy, and the reason why he opposes with such apparent hostility the friends of ideas.

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[1] επισκεπτεον δε και ποτερως εχει η του ολου φυσις το αγαθον και το αριστον· ποτερον κεχωρισμενον τι, και αυτο καθ᾽ αυτο, ἢ την ταξιν, ἢ αμφοτερως, ωσπερ στρατευμα· και γαρ εν τη ταξει το ευ και ο στρατηγος, και μαλλον ουτος. ου γαρ ουτος δια την ταξιν, αλλ᾽ εκεινη δια τουτον εστιν. Metaphys. Lib. 12, cap. 10.

CHAPTER II.

Let us now direct our attention to Aristotle's apparent opposition to Plato in his treatise On the Soul. The design of Aristotle then in this treatise is to examine the opinions of the philosophers prior to, or contemporary with him respecting the soul, to approve of whatever may be truly asserted, and to detect whatever may not be delivered according to the accustomed use of names, lest receiving the opinions of the ancients conformably to these, we should be deceived. Plato, therefore, gave the name of motion to the life of the soul, in consequence of its being evolved, and being neither in every respect partible, nor remaining purely impartible, denominating also such a life motion, from its declination from an impartible nature, and asserting that the essence of the soul is self-moveable, as being essentialized according to such a life. Hence, through the word *moveable* he indicates the subordination of this life to an impartible nature; but by the word *self*, its permanency in the impartible, and a life at the same time abiding in and proceeding from itself. But Aristotle being accustomed to give the name of motion to that nature alone which is partible, and is numbered according to continuity, conformably to the common use of the word, not only denies motion of the psychical essence, but does not appear to admit that the soul is in any way moved by itself. Thus too, Plato calls the transition which is produced through the energy of the soul motion, such as is to consider and consult; and, indeed, he denominates the regression of the soul from an intelligible and impartible essence, motion. But Aristotle alone calls that transition motion which is successive and continued. It is evident, therefore, that here also the difference between the two philosophers is in names only, and not in things.

Again, it was usual with the Pythagoreans to philosophize symbolically through the mathematics, about things supernatural, those pertaining to the soul, and such as are physical. Plato also assuming the person of the Pythagorean Timæus, as he exhibits him ascribing the five right-lined solid figures to simple bodies, so likewise, he represents him unfolding the essence of the soul of the universe, through right and circular lines; in order that he may, at the same time, indicate its middle nature, between an essence indivisible, and that which is divisible, about bodies; just as a line, also, is the middle of a point, and of solids; and its proximate subordination to intellect. And farther still, that he might indicate by this its undeviating progression, proceeding from itself, which a right line signifies, and through a circular inflexion, the conversion to itself; just as through the habitude of one right line to two, and again, of a more inward habitude to seven, he indicates the causal comprehension of the celestial spheres, according to an appropriate middle. For this comprehension does not subsist like intellect impartibly, but after the manner of soul with evolution, of which circular lines are a symbol, just as the motion of these lines is a symbol of psychical life; for, though intellect moves the heavens, yet it is in conjunction with soul, which, through its peculiar evolved life, as a middle, produces the impartible, motive, energy of intellect, into the continued and partible energy of the heavens; which energy alone Aristotle denominates motion, and opposes Timæus, as attributing to the soul an energy divisible, and attended with interval, lest we, following the accustomed use of names, and, conformably to this, receiving what is asserted by Plato, should form an opinion, that the soul is either a certain magnitude, or is corporeally moved. It is evident, also, that the connexion of the soul with the body must not be considered locally, but according to the proximate and essential presence of it through the whole of the body. But the composition of it from the elements, manifests its completion from essence, sameness, and difference, and, in short, its possession in common of the constitutive peculiarities of beings, so far as beings; this, likewise, being appropriately assumed in the soul; for all beings consist from all such things as are common, but each appropriately according to the order which it is allotted. Again the division, according to harmonic numbers, indicates the hypostasis, or subsistence of all reasons in the soul, and the mode of the subsistence, viz. declining to separation, and being collected into the impartible, and, on this account, divided according to the harmony of numbers; for harmony, through the collection of symphony, is indicative of reasons established according to different peculiarities; for *numbers are significant of peculiarities.* The Soul of the World, however, by her inherent reasons, moves the heavens with an harmonious lation, and knows the harmony which subsists in natures superior to, and subordinate to herself; because these reasons are conjoined to superior natures, according to continuity, and are the causes of subordinate natures, so that the celestial circulations are produced through the evolved life of soul. Aristotle, therefore, demonstrating that the soul is incorporeal, and that she has an energy not divided according to continuity, confutes the assertion, that she is moved circularly after the manner of corporeal magnitudes; for such a motion is adapted to bodies, as being essentialized according to interval, but, by no means, to soul, and especially to the soul of the universe.

CHAPTER III.

Again, Aristotle in his treatise On the Heavens, (Book II.) apparently opposes what is asserted by Plato in the Timæus respecting the dissolution of the world. For Plato says in that dialogue, that every thing which is bound is dissoluble; but to be willing to dissolve that which is beautifully harmonized, is the province of an evil artificer. And again the demiurgus is represented saying to the celestial gods, " You are not indeed entirely immortal, yet you shall never be dissolved, nor become subject to the fatality of death." Apparently therefore Plato seems to say, that the world is naturally dissoluble, mortal and corruptible, yet will not be corrupted. But Aristotle opposing the apparent meaning of such an assertion says, it is impossible that any thing which is of its own nature corruptible, should not some time or other be corrupted. For if it is possible, it will at the same time be corruptible and incorruptible; i. e. the same thing will be perpetual and corruptible; and it will be both in energy, and not only corruptible in capacity; but as perpetual, so likewise it will be corruptible, which is evidently absurd. For it is possible for the same thing to have the power of opposites, though it should have them perpetually; but it is impossible that it should possess the energies of opposites at one and the same time. Hence, Aristotle very properly adds, *in energy*.

But that Aristotle objects to the apparent and not to the real meaning of what Plato says, is evident. For Plato does not say that the world was generated from a certain time, since he asserts that time was generated together with the world. But that which is generated from a certain time, has time existing prior to its generation. Plato, however, says that the world was generated, in consequence of its being sensible and corporeal, and as falling off from real being, and having its existence in becoming to be. But he says that it is dissoluble and not entirely immortal, but generable in its own nature; just as Aristotle also shows, that a finite body has in its own nature a finite power. Both Plato and Aristotle however show that the world is incorruptible and immortal, on account of its proximate production from divinity; the former saying, as from the demiurgus, " Yet you shall never be dissolved, nor become subject to the fatality of death; my will being a much greater, and more excellent bond than the vital connectives with which you were bound at the commencement of youi generation;" but Aristotle asserting, that an immoveable cause, moves perpetually, and on this account that which is proximately moved by it, though in its own nature, as being finite, it possesses a finite power, yet is moved perpetually, in consequence of being moved by that which perpetually moves.

In the next place let us see according to what signification of the generable, Aristotle denies generation of the heavens, hastening to show that it is without generation; and again, according to what signification Plato says, that heaven and the world are generable. That Aristotle, therefore, calls the mutation from non-being to being that generation, to which corruption entirely succeeds, is evident from those arguments by which he shows that the heavens are not only without generation, but also that they are incorruptible. And this is still more evident, when he clearly shows that what is generated, is corruptible in every way, and that what may be corrupted is generated. Hence, demonstrating that there is a certain other fifth essence besides the sublunary elements, viz. the essence of a celestial body, and which is naturally more perfect than these, he likewise denies of this essence gravity and levity and motion in a right line, which are the peculiarities of sublunary bodies Thus also he denies of this fifth essence the generation and corruption of sublunary natures. And this indeed may be considered as indubitable; both from his calling generation and corruption a certain mutation, one thing being generated and corrupted after another, and from his showing, in contradiction to those who assert that the world was generated but is incorruptible, that what is generable is always corruptible. Nor is it at all wonderful that Aristotle always wishes to assume things obvious to every one, and to call that generable which participates of every kind of generation, and clearly appears to be generable and corruptible in a part of time. But Plato knew indeed this generation of sublunary natures which is opposite to corruption, as is evident from the tenth book of his Laws, in which he says, " The generation of all things is effected, when a certain passion becomes apparent; for instance, when the principle receiving an increase by transition arrives at the first, and from this to that which is next, and having arrived as far as to three[1] things, it possesses sense in sentient natures. By transition, therefore, and transitive motion, every thing is generated: but it is true being when it abides. When, however, it is changed into another habit, it is perfectly corrupted." He also knew another kind of generation, according to which a thing arriving at corporeal interval, is no longer able to produce itself, but alone subsisting from some other cause, is called generable, receiving a division opposite to true being, as to its proximate cause. For it is necessary that what is generated, and receives its subsistence externally, should derive its existence from true being, and that which is self-subsistent; or there must be a procession to infinity, and the generable must always be admitted prior to the generable. But defining this generable after true being, in the Timæus, he says, that according to it the world is generable. And the definition indeed of both being produced from the gnostic powers in us, is as follows: " What is that which is always being, but which is without generation, and what is that which is becoming to be indeed, but is never being? That which may be comprehended, therefore, by intelligence in conjunction with reason, and which always possesses an invariable sameness of subsistence, is *being*; but that which is apprehended by opinion in conjunction with irrational sense, is that which is generable and destructible, and is never truly being." According to this kind of generable, therefore, Plato says, that the world was generated by true being; for he thus writes about the

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[1] That is, when from length it has arrived at breadth, and afterwards at depth.

world: " Whether shall we say that the world always was having no principle whatever of generation, or that it was generated? It was generated; for it is visible and tangible, and has a body. And every thing of this kind appears to be generated and generable." For that which is self-subsistent ought to be impartible, and the whole must be adapted to the whole of itself. Hence that which is not self-subsistent, has entirely its existence from something else; and on this account is said to be generated. Since, however, some perversely understanding the destructible in the definition of that which is generated, fancy that Plato admitted the corruption of the world and the heavens, it is necessary to show what the destructible here signifies. That Plato, therefore, when to that which is generated he adds, " *But which never truly is,*" clearly shows that an eternal nature is exempt from an existence in some portion of time is evident from what has been already observed. For *an existence sometimes* is never properly asserted of eternal natures. But that which always has a subsistence, in consequence of being proximately produced by true being and an immoveable cause, and through this again is neither self-subsistent, nor true being, nor the whole and all of it subsisting at once, in the same manner as true being;—a nature of this kind has a *certain* mutation, at different times receiving a different condition, because its proximately producing cause subsists in conjunction with the immoveable, and because in consequence of its own aptitude, it proximately derives its existence from true being. But that Plato did not fancy this mutation belongs to it as to that which is generated and corrupted in a part of time, but that it pertains to it in consequence of a corporeal nature, through which it has not the whole of its blessedness at once, in the same manner as true being, may be easily learnt from what is written in the Politicus, as follows: " That which we denominate heaven or the world, has derived many and blessed prerogatives from its generator. Since, however, it communicates with body, it is impossible for it to remain entirely free from mutation. And if indeed it were corrupted into another world, it would have a place of mutation; but if into non-being, it could no longer be said to be changed. For that which has transition is changed from one thing into another. How, therefore, could he say, "*entirely free*," if it had not something mutable? That, however, Plato did not think that the world was generated in a part of time, or that it would be corrupted in a part of time, is evident from what he says in the Timæus. For in the first place, he there clearly asserts, that time was generated together with the heaven, *i. e.* the world. It is impossible, therefore, for time to have existed prior to the world. But if this be the case, the world did not begin to be generated from a certain time. For time would have existed prior to itself, and prior to that *now* in which the world was generated; there would entirely have been some past time. Neither is it possible for the world to be corrupted in a part of time. For again, after this *now* in which it is corrupted, there will be some future time. But if Plato says, "Time was generated together with the heaven, that being generated together, they may also together be dissolved, if ever a dissolution of them shall take place," through this he shows that the world is indissoluble. For if it is necessary that the world should be dissolved together with time, if it ever will be dissolved, but time is indissoluble, since that which is some time or other dissolved will have time posterior to it, *some time* being a part of time, the world is evidently indissoluble. To what has been observed, this also may be added, that the world is said by Plato to be generated, in consequence of its artificer looking to an eternal paradigm, in order that it might as much as possible be similar to it. For because it is generated according to this paradigm it is perpetual; having its essence co-extended with the infinity of time. How, therefore, will a thing of this kind be generated from a certain time; for instance, six thousand years ago? Or can that be corrupted in a certain time, which in all time is becoming to be, and is, and will be? But those who are not able to separate the perpetuity of this time from the eternal, are not ashamed to say that time is always generated and corrupted in a part of time. They also adduce Plato as a witness, who says, "that the world was generated most similar to all-perfect and intelligible animal itself, in imitation of an eternal nature." Though how can that be most similar to the eternal, which is generated in a part of time, and that a very small part, as they say, and especially if it be compared with the perpetual? What occasion is there, however to be prolix, since Plato clearly says, that celestial and sublunary natures, the earth and the wholeness of the other elements, participating of a certain mutation from their own nature which is corporeal and endued with interval, are not entirely immortal; but through the goodness of him by whom they were proximately fabricated, who always imparts to them his own good, they are indissoluble, and will never receive the destiny of death. It is better, however, to hear the words of Plato, in the Timæus, or rather of the fabricator of the universe, whose intellect and energies Plato prophetically announcing to us, exclaims as follows: " When, therefore, all such gods as visibly revolve, and all such as become apparent when they please, were generated, the Artificer of the universe thus addressed them: Gods of gods, of whom I am the demiurgus and father, whatever is generated by me is indissoluble, such being my will in its fabrication. Indeed, every thing which is bound is dissoluble: but to be willing to dissolve that which is beautifully harmonized and well composed, is the property of an evil nature. Hence, so far as you are generated, you are not immortal, nor in every respect indissoluble, yet you shall never be dissolved, nor become subject to the fatality of death; my will being a much greater and more excellent bond than the vital connectives with which you were bound at the commencement of your generation. Learn, therefore, what I now say to you indicating my desire. Three genera of mortals yet remain to be produced. Without the generation of these, therefore, the universe will be imperfect; for it will not contain every kind of animal in its spacious extent. But it ought to contain them that it may be sufficiently perfect. Yet if these are generated, and participate of life through me, they will become equal to the gods. That mortal natures, therefore, may subsist, and that the universe may be truly all, convert yourselves according to your nature, to the fabrication of animals, imitating the power which I employed in your generation. And whatever among these is of such a nature as to deserve the same appellation with immortals, which obtains sovereignty in these, and willingly pursues justice,

tice, and reverences you,—of this I myself will deliver the seed and beginning: it is your business to accomplish the rest; to weave together the mortal and immortal nature; by this means fabricating and generating animals, causing them to increase by supplying them with aliment, and receiving them back again when dissolved by corruption." What then can more clearly show than this passage, that Plato considered those beings, which proximately derive their subsistence from the artificer of the universe, to be indissoluble and immortal from his goodness; though these beings, in consequence of having an *adventitious union*, which he denominates a *bond*, are dissoluble so far as pertains to themselves, *i. e.* so far as respects their own proper separation from being. And what can be clearer than this: "You are not in every respect immortal, *i. e.* immutable, according to every kind of mutation, as I am; yet you shall never be dissolved, nor become subject to the fatality of death?" And who can be so shameless or insensate, as to fancy, after these words, that Plato thought the world was corruptible? Nor is this less manifest when he says, "three genera of mortals yet remain to be produced," the junior gods, that is, the stars and spheres of the elements, being evidently not mortal. And the demiurgus orders these perpetual natures to mingle the whole of a mortal with a perpetual essence, by their natural conversion and motion; for mortals could not otherwise be generated unless that which produces them is mutable. Hence, he adds, "That mortal natures, therefore may subsist, and that the universe may be truly all, convert yourselves according to your nature to the fabrication of animals." How, therefore, can celestial natures be mortal which are produced by the demiurgus who energizes immoveably and perpetually? But the words, "fabricating and generating animals, causing them to increase by supplying them with aliment, and receiving them back again when dissolved by corruption," appear to be addressed to the gods who preside over the wholes of the elements, so far as these wholes also have something perpetual. For from the proximately sublunary elements, partial animals are generated, nourished and increased; and when corrupted, are again resolved into the wholenesses of the elements.

But Aristotle signifies that he considers a celestial body to be exempt from contraries, not simply from contraries according to their characteristic peculiarity, but from those which change into each other, and are incapable of being mutually co-existent, such as are sublunary contraries. For it is evident that a celestial body participates at the same time of motion and permanency in consequence of being circularly moved in the same place. It also participates of sameness and difference, unity and multitude; but these are co-existent and consubsistent with each other; yet they are not, like sublunary natures, corrupted, nor changed into each other.

CHAPTER IV.

In the last place, I shall present the reader with what Aristotle says apparently in opposition to the doctrine of the Pythagoreans and Plato respecting the generation of bodies from planes; to which from its great importance and excellence, I shall add the comment of Simplicius. Aristotle then in Chap. 11, Book 4, of his treatise On the Heavens, observes as follows: " Again, therefore, it must be considered what is the mode of the generation of the elements from each other, whether as Empedocles and Democritus say, or as those who dissolve the elements into planes, or whether there is any other mode besides these. It has escaped the notice therefore of Empedocles and Democritus that they do not make the generation of things from each other, but introduce apparent generation. For each thing being inherent in each, they say things are separated, as if generation were from a vessel, and not from a certain matter, and things were not generated by mutation. In the next place admitting that generation thus subsisted, the consequences would be no less absurd. For the same magnitude would not appear to become heavier by condensation. And it is necessary that this should be asserted by those who say that water being in air is seperated from it. For when water is generated from air, it becomes heavier. Again, bodies being mingled together, it is not necessary that one of them being separated, the other should always occupy a greater place. But when air is generated from water, the air occupies a greater place; for that which consists of more attenuated parts, exists in a more ample place. This is evident in mutation. For in consequence of that which is humid evaporating, and becoming inflated, the vessels containing the liquid bulks, burst through narrowness. Hence, if, in short, there is not a vacuum, and bodies are not extended as those assert who thus speak, the absurdity of this hypothesis is evident. But if there is a vacuum and extention, it is absurd that what is separated should always necessarily occupy a greater place. It is also necessary that the generation of the elements from each other should at length fail, if in a finite magnitude there are not infinite finite magnitudes. For when water is generated from earth, something of earth is taken away, if generation is separation; and again, when from what remains water is in a similar manner generated. If therefore, this will always take place, it will happen that infinites will be inherent in a finite body. Since however this is impossible, the elements will not be generated from each other. We have shown therefore that the mutation of the elements into each other is not separation. Hence it remains that they are generated by a mutation into each other. But this is twofold: for it is effected either by transformation, just as from the same wax a sphere and a cube are produced; or as some say by a dissolution into planes. If, therefore, they are generated by transformation, it will happen from necessity that the bodies themselves must be said to be atoms. For if they are divisible, a part of fire will not be fire, nor a part of earth, earth, because neither is a part of a pyramid always a pyramid, nor of a cube a cube. But if the elements are generated by a dissolution into planes, in the first place it is absurd that all things should not be generated from each other, which it is necessary they should say, and which they do say. For neither is it reasonable to suppose that one part only is destitute of mutation, nor is it apparent to sense that it is so, but all things are seen similarly to change into each other. But it happens to them when speaking about the phænomena, that their assertions are not conformable to the phænomena; and this is because they do not properly assume first principles, but wish to refer all things to certain definite opinions. For perhaps it is necessary that the principles of sensibles should be sensible, of things perpetual, perpetual, of things corruptible, corruptible, and, in short, that they should be homogeneous to their subjects. These physiologists, however, through the love of these opinions, appear to do the same thing as those who preserve the positions in their arguments; for they sustain every thing which happens, as having true principles, as if it were not fit to judge of some things from what happens, and especially from the end. But the end of the effective science is a work; but of the natural science, that which is always properly apparent according to sense [1]. It also happens to

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[1] It is here necessary to relate more fully the hypothesis of the Pythagoreans and Plato, in order to a more accurate comprehension of what will be said. They supposed then two primogenial right-angled triangles, the one isosceles, but the other scalene, having the greater side the double in length of the less, and which they call a semi-triangle; because it is the half of the equilateral triangle which is bisected by a perpendicular from the vertex to the base. And from the isosceles triangle indeed, which Timæus calls a semi-square, four such having their right angles conjoined in one centre, a square is formed. But the union of six such triangles having eight angles, forms a cube, which is the element of earth. But the semi-triangle constitutes the pyramid, the octaedron, and the icosaedron, which are distributed to fire, air, and water. And the pyramid indeed consists of four equilateral triangles, each of which composes six semi-triangles. But the octaedron consists of eight equilateral triangles, and forty-eight semi-triangles. And the icosaedron is formed from twenty equilateral triangles, but one hundred and twenty semi-triangles. Hence these three being composed from one element, viz. the semi-triangle, are naturally adapted, according to the Pythagoreans and Plato, to be changed into each other; but earth, as being composed from another triangle specifically different, can neither be resolved into the other three bodies, nor be composed from them.

Since, however, says Simplicius, some of the Platonists have opposed these objections against the generation of bodies from planes, and Proclus of Lycia also, the successor of Plato, who lived a little prior to me, has written a book, in which these objections of Aristotle are solved, it appears to me that I shall do well in subjoining his solutions with as much brevity as possible. At the same time, as I have frequently observed, and which it will be most opportune now to repeat, there is no real dissonance between these two philosophers Plato and Aristotle; but the latter frequently objecting to the apparent meaning of the words of the former, which may be misconceived, to them that earth is especially an element, and is alone incorruptible; if that which is indissoluble is incorruptible and an element. For earth alone

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ed, and sparing those who superficially understand Plato, seems to contradict him, which, in the present case, may I think be very clearly seen, in what Plato has written conformably to the Pythagoric Timæus. For that of the generation of these four bodies, fire, air, water, and earth, prior to the qualities of heat, cold, dryness, and moisture, he investigates other prior principles, from the differences in quantity, as being more allied to bodies, is evident from this, that the differences of those qualities originate from the differences of figures. For we have before observed from Theophrastus, that Democritus considered the solutions derived from the hot and the cold to be idiotical, the soul desiring to hear a certain principle more adapted to body, than such like energies of heat and cold. That the Pythagoreans indeed said, that the four elements are generated from matter and form, Timæus briefly evinces, when he says, "that the principle of generated natures, as a subject is matter, but as the reason of *morphe*, form. But the progeny of these are bodies, earth and water, air and fire, of which the blossom is as follows: Every body is composed from planes; and these are composed from triangles." For he assumes a plane, as prior to body, and in a plane, a triangle; this being the first of plane figures; and in triangles the scalene, have more the rank of a principle. And thus the first and most beautiful bodies, the pyramid, and the bodies co-ordinate with it are composed. But all these, says Plato, it is necessary to understand exist so obscurely, as that in every genus one of them through its smallness appears to us to be nothing, but that when many of them are collected together, their bulks become visible. And that the Pythagoreans indeed, as I have said, thought that figures are prior to qualities is evident. That they likewise supposed such figures from a probable reason, because these hypotheses are similar to those of astronomers, by which they preserve the phænomena, is evident from the Timæus of Plato.

But in answer to the objection of Aristotle, that if the elements are generated by a dissolution into planes, it is absurd that all things should not be generated from each other, Proclus observes, that we must assert the very contrary. For the phænomena do not accord with those who transmute earth, and move things immoveable. For we never see earth changed into other things; but terrestrial natures are changed, so far as they are full of air or water. All earth however is unchangeable, because earth alone becomes as it were ashes or a calx. For in metallic operations, the whole of the moisture in metals is consumed, but the ashes remain impassive. Not that earth is entirely impassive to other things; for it is divided by them falling upon it; yet the parts of it remain, until again falling on each other, they again make one body from them. But if it should be said that earth on account of its qualities, is changed into other things, being itself cold and dry, earth will be more swiftly changed into fire than into water: though water indeed appears to be burnt, but earth when subsisting by itself, (i. e. when it is pure earth, and earth alone) is not burnt. He adds, And the heaven indeed, is neither divisible nor mutable; but the earth existing as the most ancient of the bodies within the heaven, is divisible, but not mutable; and the intermediate natures are both divisible and mutable. Thus far Proclus. It must be observed however, that alone is incapable of being dissolved into another body[a]. But neither in those things which are dissolved is the omission of triangles reasonable.

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that things which consist of the same matter must necessarily change into each other, the matter sustaining the mutation; and this is also testified by Plato. For he says that matter perpetually receives all things, but never in any respect assumes any one similar form of the things which enter into it. For it is naturally a resemblance of the motions and figures of the influent forms: and these appear differently, at different times. But the forms which enter into and depart from this receptacle, are the imitations of perpetually true beings, and are signified by them in a manner wonderful and difficult to describe. Nor must we omit to observe, that Plato says that in a certain respect earth is generated from other things and in a certain respect is immutable. Neither Plato however appears to dissent from himself, nor Aristotle from Plato. For so far as earth also subsists from the same first matter, Plato says that it changes into other things, and is composed from other things; but that so far as it subsists from a proximate isosceles triangle, it is immutable. For as long as the triangles preserve their property, neither earth can be generated from a semitriangle, nor other things from the isosceles triangle. But when the triangles themselves being worn out, are again composed and figured, then the former isosceles, either the whole or a part, becomes a semitriangle; and here the generation of earth from other things, and the generation of other things from earth, becomes apparent; if the dissolution of the triangles takes place as far as to matter. For if this is not admitted, the discussion about formless matter, which is perfectly the recipient of the forms of all things, is vain.

[a] The philosopher Proclus replies to this objection, yielding to what Aristotle says about earth, viz. that it is perfectly incapable of being changed into the other three elements. And he says that Plato on this account calls it the first and most ancient of the bodies within the heaven, as unchangeable into other things, and that the other elements give completion to the earth, in whose bosom they are seated, viz. water, air, and sublunary fire. But its being after a manner divided by the other elements, makes it to be one of them; for division is a passion which exterminates continuity. If, however, it suffers being divided by the other elements, and energizes on them, embracing, compressing, and thus causing them to waste away, it is very properly co-divided with those things from which it suffers, and on which it energizes, according to the same passion in a certain respect. For there is a division of each, though the more attenuated are divided by the more sharp in one way, as in the arts by saws, augers and gimblets; and the more gross in another way, by trampling and compression. Thus far the philosopher. Simplicius adds, Perhaps however, as I have before observed, though earth is not immediately changed into the other elements, yet the dissolution of it into common matter, causes earth to be generated from the other elements, and the other elements from earth. And see how this accords with things that are generated. For though earth energizes upon the other elements, and is passively affected by them, yet this is without time, and scarcely. For earth does not suffer from fire, in the same manner as air and water, nor yet from water or air in the same manner as the other elements: nor does it so easily yield its place to motive natures as the rest. For in reality it is necessary that the body which subsists about the centre of the

ble. This however takes place in the mutation of the elements into each other, because they consist of triangles unequal in multitude[3]. Farther still, it is necessary that those who assert these things should not make generation from body. For since it originates from planes, it will not be produced from body[4]. And besides this, it is necessary not to call every body divisible, but to oppose the most accurate sciences;

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the universe, should neither be easy to be moved, essentially, nor yet according to energy. But why the earth is the most ancient of the bodies within the heaven, Plato does not assign the cause. Timæus however himself in his treatise from which Plato took occasion to compose his Timæus, thus writes about the earth: "But earth is the most ancient of the bodies within the heaven; for water is never generated without earth, nor yet any air without moisture; and fire when destitute of moisture, and matter which it may burn, cannot remain. Hence earth is the root and basis of the other elements; but in the bosom of the earth, air and fire are seated, not indeed pure air and fire, but such as are stagnant." And Plato in the Phædo praises the summit of the earth, as being extended as far as to the æther, employing (Simplicius adds) in my opinion, much of the fabulous and enigmatical; for he calls the discourse about it a fable. For farther particulars about this summit of the earth, see the Introduction to my Translation of the Timæus, and also the notes to my translation of the Phædo of Plato.

[3] The philosopher Proclus here observes, that in the dissolution of water into air when fire resolves it, two parts of air are generated, and one part of fire. But when on the contrary water is generated from air, three parts of air being resolved, the four triangles which are mingled together from the same cause, viz. from condensation, together with two parts of air, make one part of water. He adds, But it is not at all wonderful that they should be moved in a certain form; for it must be granted that in all mutations there is something without form to a certain extent; but being vanquished by some form, they pass into the nature of that which vanquishes. For we also acknowledge, that in the mutation of the elements with which we are conversant, certain half-generated parts frequently remain.

[4] Aristotle adduces as a fourth-absurdity, that this hypothesis makes the generation of body simply, but not of some particular body. But if body is generated upon body, it was before shown that there must necessarily be a separate vacuum; which neither do the authors of this hypothesis admit. For if body is generated, it is generated from that which is incorporeal. It is necessary therefore, that there should be some void place the recipient of the generated body. Hence if they say that body is generated from planes, it will not be generated from body; for a plane has length and breadth alone. To this however Proclus replies, that natural planes are not without depth; for if body distends the whiteness which falls upon it, it will much more distend the planes which contain it. But if the planes have depth, the generation of fire will no longer be from that which is incorporeal; but the more composite will be generated from a more simple body.

for the mathematical sciences consider that which is intelligible (i. e. body abstracted from sensible qualities) as divisible. These physiologists however do not admit that every thing sensible is divisible, because they wish to save their hypothesis. For those who attribute a figure to each of the elements, and by this distinguish the essences of them, necessarily make them to be indivisibles. For a pyramid or a sphere being in a certain respect divided, that which remains will not be a sphere or a pyramid. Hence either a part of fire is not fire, but there will be something prior to an element, because every body is either an element or from elements; or not every body is divisible[5].

In short, to endeavour to give figures to simple bodies is unreasonable. In the first place because it will happen that the whole will not be filled. For in planes indeed, three figures appear to fill place, viz. the triangle, the square, and the hexagon; but in solids two figures alone, the pyramid and the cube. It is necessary however that more than these should be assumed, because they make more elements than two[6]. In the next place, all simple bodies appear to be figured in the place which contains them, and especially water and air. It is impossible therefore that the figure of an element should remain; for the whole would not on all sides touch that which contains it. But if it were changed into

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[5] Proclus in reply to this, blames him who makes fire to be a pyramid, and who does not abide in the Platonic hypothesis, since Plato says that a pyramid is the figure of fire, but he does not say that it is fire. For fire is a collection of pyramids, any one of which is invisible on account of its smallness, nor will fire so long as it is divided into fire, be divided into pyramids. But one pyramid is no longer fire, but the element of fire, invisible from its smallness. If therefore this pyramid were divided, it would neither be an element, nor composed from elements, since it would not be divided into pyramids or planes. And why is it wonderful that there should be something inordinate in sublunary bodies? For in the mutation of the elements with which we are conversant, there is something inordinate. Proclus adds, that certain differences also are produced which occasion pestilential consequences in the whole genus, and turn the elements into a condition contrary to nature. But what impossibility is there, says he, that this section of an element being taken, and fashioned into form and figure by atoms, should again become a pyramid, or some other element, in consequence of being assimilated to the natures which comprehend and compress it.

[6] This sixth argument of Aristotle endeavours to show, that if the elements are fashioned with the above mentioned figures, there must necessarily be a vacuum, which is not even asserted by the advocates for planes. But he shows this from there being but few figures both in planes and solids which are able to fill the place about one point, so as to leave no vacuum. In planes indeed this

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this can only be accomplished by the equilateral triangle, the square, and the hexagon, viz. by six equilateral triangles, four squares, and three hexagons. But in solids the pyramid and cube alone can fill the place which is about one point. Of the first part of this admirable theorem, which is also mentioned with the praise it deserves by Proclus in his Commentary on the first book of Euclid (p. 101 of my translation) the following demonstration is given by Tacquet. In order that any regular figures frequently repeated may fill space, i. e. form one continued superficies, it is requisite that the angles of many figures of that species composed about one point, make four right angles; for so many may exist about one point, as is evident from coroll. 3, prop. 13, of the first book of Euclid. Thus, for instance, that equilateral triangles may fill place, it is requisite that some angles of such triangles composed about one point should make four right angles. But 6 equilateral triangles make 4 right angles; for one makes $\frac{2}{3}$ of one right angle, and therefore 6 make $\frac{12}{3}$ of one right, i. e. 4 right angles. The 4 angles of a square also, as is evident, make 4 right angles; and this is likewise the case with the 3 angles of a hexagon. For one makes $\frac{4}{3}$ of one right, and consequently 3 make $\frac{12}{3}$ of one right, that is, again 4 right. But that no other figure can effect this, will clearly appear if its angle being found, it is multiplied by any number; for the angles will always be less than, or exceed 4 right angles.

But in solids, says Alexander, as we are informed by Simplicius, why is it requisite to say that a cube fills place? For if four cubes are brought into contact according to their sides, they will evidently fill place. Besides, a cube has the same relation among solids, that a square has among planes. But a square fills place in planes, and consequently a cube will fill place in solids. It is likewise evident that a pyramid will fill place. For a pyramid is nothing else than the angle of a cube. Since therefore the angles of a cube fill place, a pyramid also will fill place. Besides a cube itself is completed from two pyramids. A sphere likewise may be divided into eight pyramids. If therefore eight pyramids are placed together having their summits in the centre of the sphere, they will fill place. Farther still, a pyramid among solids has the same relation that a triangle has among planes; but a triangle in places fills plane, and therefore a pyramid in solids.

But Proclus observes in reply to he argument of Aristotle, that the elements being placed by each other, and supernally compressed by the heaven, the more attenuated are compelled into the places of the more gross. Hence being impelled and entering into the place about one point, they fill up the deficiency. For Plato also, says he, assigns this as the cause of no vacuum being left, viz. that lesser are ranged about greater things. For thus the cavities of the air indeed have pyramids which fill up the place; these of water have dispersed octaedra, and those of earth have all the figures, and no place is empty.

another figure, it would no longer be water, if it differed in figure; so that it is evident that the figures of it are not definite. Nature indeed seems to signify this very thing to us, which is also conformable to reason. For as in other things it is necessary that the subject should be without form and *morphe;* since thus especially the universal recipient can be properly adapted to receive all forms, as it is written in the Timæus; in like manner it is necessary to consider the elements as having the relation of matter to composites. Hence also they are able to be changed into each other, when the differences which subsist according to passive qualities are separated from them [7]. Besides, how can flesh and bone be generated, or any other composite body? For it can neither be effected from the elements themselves, because that which is continued is not generated from composition; nor from the conjunction of planes: for the elements are generated by composition, and not those things which consist from the elements. Hence he who wishes to speak with accuracy, and not to admit assertions without examination, will perceive that these physiologists take away generation from things in existence[8]. Moreover with respect to passive qualities, powers, and motions, figures are unadapted to bodies, to which especially looking, they thus distributed figures. Thus, for instance, since fire is easily moveable, and possesses the power of heating and burning, some have made it to be a sphere, and others a pyramid. For these figures are most easily moveable, because they touch the smallest things, and are in the least degree stable. But they are most calorific and caustic, because the one is wholly an angle, but the other is most acute-angled. And they burn and heat as they say by angles. In the first place, therefore, both err with respect to motion. For though these are the most easily moveable of all figures, yet they are not easily moveable according to the motion of fire. For the motion of fire is upward, and according to a right line; but these figures are easily moveable in a circle, with a motion which is called rolling. In the next place, if the earth is a cube because it is stable and abides; and if it abides, not casually, but in its proper place, and is moved from a foreign place, if nothing impedes it; and if this in a similar manner happens to fire and the other elements; it is evident that fire and each of the elements, in a foreign place will be a sphere or a pyramid, but in its proper place a cube[9]. Farther still, if fire heats and burns through its angles, all the elements will impart heat, but one perhaps more than another; since all of them will have angles; as for instance the octaedron, and the dodecaedron. But according to Democritus a sphere also burns, as being a certain angle; so that they will differ by the more and the less. This however is evidently false[1], At the same time also it will happen that mathematical bodies will burn and impart heat; for these likewise have angles; and atoms, cubes, spheres, and pyramids are inherent in them; especially if, as they say, there are indivisible magnitudes. For if some of them burn, and others do not, the cause of this difference must be assigned, but not simply so as they assign it[2]. Again, if that which is burnt is ignited, but fire is a sphere or pyramid; it is necessary that what is burnt should become a sphere or pyramid. Let it be reasonable therefore that to

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[7] Proclus in opposition to this seventh argument observes, that he does not admit that the elements have a characteristic figure, since they can neither have it stably, nor abandon it. He also says, that it is not the *wholenesses* of these four bodies which are fashioned with these figures, but the elements of these, viz. those small and invisible bodies, from the congress of which these sensible natures, fire, water, air, and earth are produced. But the wholes of the elements have a spherical figure, being on all sides assimilated to the heaven. For each of them has something better than its own characteristic property, from more divine natures, just as things which approximate to the heaven have a circular motion. It is evident therefore, that the last of the pyramids which are with the circumambient (i. e. which are in contact with the sphere of the moon, this being the sphere in which fire is proximately contained) though they consist of plane triangles, yet being compressed they become convex, in order that they may be adapted to the cavity of the heaven. But the parts existing in other things, as in vessels, and receiving configuration together with them, do not destroy the figure of the elements. For the bodies which contain others, says he, are from right-lined elements, and nothing prevents them from concurring with each other. But we, expecting to see the superficies of the containing bodies, to be cylindrical or spherical, in consequence of being ignorant that they also consist of right-lined elements, are involved in doubt. All the containing natures therefore were from the same things as the natures contained, and all are adapted to each other according to planes.

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[8] Proclus in objection to this eighth argument says, that composition is not produced from air alone, nor from water alone. In these therefore, things that have the smallest parts being assumed between those that have great parts, fill place and leave no void. But if, says he, it is opposition, and not union, you must not wonder; for it is necessary that they should be distant from each other. And if when placed by each other, they are with difficulty separated, neither is this wonderful; bodies which consist from larger planes, not being naturally adapted to yield to those which consist from smaller, nor those which are composed from firmer, to those which derive their composition from easily moveable planes.

[9] In opposition to this ninth argument Proclus says, that though the elements are in their proper places, yet such as are composed from easily-moveable figures, are not without motion. For pyramids are always moved, from the dissimilitude of the vertex to the base. Thus also the elements of air when it exists in its proper place, are assimilated to things perpetually flowing; and the elements of water love collision. For the summits are adjacent to the bases of their similars, and being impelled they strike against the whole in the place in which each is contained. But being thus moved, they imitate the motion in a circle, neither being moved from the middle, nor to the middle, but revolving about each other in their own place. The elements of earth however remain

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remain, because they have their summits the same with their bases. But nothing similar acts on the similar, whether they possess similitude according to figure, or according to power, or according to magnitude.

[1] Proclus in opposition to this tenth argument says, that it is improperly assumed that an angle is calorific, and that a false conclusion is the consequence of this assumption. For Timæus assumes from sense, that the sharp and the divisive are certain properties of heat. But that which cuts, cuts not simply by an angle, but by the sharpness of the angle, and tenuity of the side. For thus also the arts make incisive instruments, and nature sharpens the angles of those teeth that are called the incisores, and giving breadth to the grinders has attenuated the sides. An acute angle also is subservient to rapid motion. Hence a power of this kind is not to be ascribed to an angle simply, but to the penetrating acuteness of the angle, the incisive tenuity of the side, and the celerity of the motion. It is likewise necessary that magnitude should be present as in the pyramid, that it may forcibly enter. If therefore, in fire alone, there is acuteness of angle, tenuity of side, and swiftness of motion, this element alone is very properly hot. This however is not the case with all fire, but with that alone which consists from larger pyramids; on which account as Timæus says, there is a certain fire which illuminates indeed, but does not burn, because it is composed from the smallest elements. And according to this fire is visible.

[2] Proclus, well opposing what is here said, does that which Aristotle desires; he assigns the difference consequent to the hypotheses according to which some bodies burn, but mathematical bodies do not burn. For Plato says that these are material and moved figures; on which account also he says that ρ is added to the name, this letter being the instrument of motion. Not every thing therefore which is angular is calorific, unless it is the acute-angled, is attenuated in its sides, and may be easily moved.

cut and divide should be accidents to figure; yet that a pyramid should necessarily make pyramids, or a sphere spheres, is perfectly absurd; and is just as if some one should think that a sword may be divided into swords, or a saw into saws[3].

Farther still, it is ridiculous to attribute a figure to fire for the purpose of dividing alone; for fire appears rather to collect and bring boundaries together, than to separate. For it separates things which are not of a kindred nature, and collects those which are. And the collecting indeed is essential; for to bring boundaries together, and to unite is the property of fire; but the separation is according to accident; since collecting together what is of a kindred nature, it separates that which is foreign. Hence, either for the purpose of effecting both these, a figure ought to be attributed to fire, or rather for the purpose of collecting[4]. In addition to these things, since the hot and the cold are contrary in capacity, it is impossible to attribute any figure to the cold, because it is necessary that the figure which is attributed should be a contrary, but nothing is contrary to figure. Hence all physiologists omit this though it is fit either to define all things or nothing, by figures[5]. But some endeavouring to speak about the power of the cold assert things contrary to themselves; for they say that the cold is that which consists of great parts, because it compresses, and does not pass through pores. It is evident therefore, that the hot will be that which pervades; and that which consists of attenuated parts will be a thing of this kind. Hence it will happen that the hot and the cold will differ by smallness and magnitude, and not by figures. Again, if the pyramids are unequal, those that are great will not be fire; nor will figure be the cause of burning, but of the contrary. From what has been said therefore it is evident that the elements do not differ by figures[6]. But since the most proper differences of bodies, are those which subsist according to passive

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[3] To this also Proclus replies, that fire dissolves the elements of that which it burns, and transmutes them into itself. But a sword does not act upon the essence of that which it cuts. For it does not dissolve the essence of it, but by dividing it, makes a less from a greater quantity; since it has not its figure essentially, but from accident. If therefore, says he, nothing which cuts changes that which is cut into the essence of itself, nor dissolves the form of it, how can it make a division into things similar to itself? But it may be said, let bodies which are burnt be dissolved into triangles, for instance, water and air, and the elements of them the icosaedron and octaedron, yet what is it which composes the triangles of these, into the figure of fire, viz. into the pyramid; so as that many such being conjoined, fire is produced? Plato says therefore in the Timæus, that the triangles being dissolved by fire, do not cease to pass from one body into another, until they come together into another form, for instance the triangles of the icosaedron which are divisible into octaedra, or rather till they pass into fire which is of a divisive nature. For if they are composed into the nature of fire, they cease their transition; since similars neither act upon, nor suffer from each other. But it will be well to hear the most beautiful words themselves of Plato: "When any one of the other forms (he says) becoming invested by fire, is cut by the acuteness of its angles and sides, then, passing into the nature of fire, it suffers no farther discerption. For no species is ever able to produce mutation or passivity, or any kind of alteration, in that which is similar and the same with itself; but as long as it passes into something else, and the more imbecil contends with the more powerful, it will not cease to be dissolved." It is evident however, that the planes are not composed casually and as it may happen, at one time in this, and at another in that figure, but that which dissolves them exterminates the aptitude which they had to that figure, for instance, to the icosaedron, this aptitude being more gross and turbulent, and transfers it to the purer aptitude of the air which is near. And in the first place, they acquire a bulk from octaedra. Afterwards being dissolved by fire, they are more purified and attenuated, and become adapted to the composition of a pyramid. But it is evident that to whatever form they are adapted from their figure, they easily receive this form, and on this account, from water air is first generated, and then from air fire.

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[4] Proclus opposes this argument, and says that the very contrary is true. For fire essentially separates, but collects things together accidentally; since to take away things foreign from such as are similar, predisposes their concurrence into each other, and their tendencies to the same thing. For all fiery natures, according to all the senses, have a separating power. Thus heat separates the touch, the splendid separates the sight, and the pungent, the taste. And farther still, all medicines which are of a fiery nature, have a diaphoretic power. Again every thing which collects, wishes to surround that which is collected, at the same time compelling it; but fire does not wish to surround, but to penetrate through bodies. Proclus adds, that according to those also, who do not give figures to the elements, fire is thought to rank among things of the most attenuated parts. But a thing of this kind is rather of a separating nature entering into other things, than of a collective nature. That what essentially separates however, belongs to fire, is evident from this, that it not only separates things heterogeneous from each other, but every particular thing itself. For it melts silver and gold, and the other metals, because it separates them.

[5] This objection also Proclus dissolving says that the argument of Aristotle very properly requires that a figure should be assigned adapted to the cold; but that it is necessary to recollect concerning heat, how it was not said that heat is a pyramid, but that it is a power effective through sharpness of angles, and tenuity of side. Cold therefore is not a figure, as neither is heat, but it is the power of a certain figure. And as heat is incisive, so cold has a connective property. And as the former subsists according to sharpness of angles, and tenuity of sides, so on the contrary the latter subsists according to obtuseness of angles, and thickness of sides. Hence the former power is contrary to the latter, the figures themselves not being contrary, but the powers inherent in the figures. The argument however requires a figure, not in reality contrary, but adapted to a contrary

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trary power. Such figures, therefore, as have obtuse angles, and thick sides, have powers contrary to the pyramid, and are connective of bodies. But such figures are the elements of three bodies. Hence all things that congregate, congregrate through impulsion, but fire alone, as we have observed, has a separating power." Thus far Proclus, Simplicius however observes, that it may be doubted, how the powers which are in figures, being, as he says, contrary, the figure themselves will not be contrary; for powers are adapted to things by which they are possessed. Perhaps therefore, he calls the four figures, the pyramid, and the other regular bodies, which not being contrary, their powers are contrary; since their powers are not according to their figures. For neither the thick, nor the thin, neither that which has large, nor that which has small parts, neither that which is moved with difficulty, nor that which is easily moved, are the differences of figure. Perhaps too, neither are acuteness nor obtuseness of angles simply the differences of figure, since neither is an angle simply a figure. If therefore the dispositions of the hot and the cold which are contrary, are effected according to these contrarieties, no absurdity will ensue. Hence the proposition which says, that things which are determined by figures are not contrary, requires a certain circumscription. For they are not contrary according to figures, yet they are not prevented from having contraries. If however some one should insist, that contrarieties are according to figures, it is necessary to recollect that Aristotle in this treatise says, that there is also in figures a certain contrariety. But as we have inserted the words of Plato concerning heat, it will also be well to insert what he says about cold, and which is as follows: "The moist parts of bodies larger than our humid parts, entering into our bodies, expel the smallar parts; but not being able to penetrate into their receptacles, coagulate our moisture, and cause it through equability to pass from an anomalous and agitated state, into one immoveable and collected. But that which is collected together contrary to nature, naturally opposes such a condition, and endeavours by repulsion to recall itself into a contrary situation. In this contest and agitation, a trembling and numbness takes place; and all this passion, together with that which produces it, is denominated cold."

[6] Aristotle adds this fifteenth argument, after all that has been said, objecting to magnitude; and showing that the Pythagoreans make the power of cold a cause, as consisting of great parts, because it compresses and does not pass through pores, as is indicated by the above cited words of Plato. Proclus however in opposition to this observes as follows: We do not determine the elements of simple bodies by magnitude alone, but also by thinness and thickness, by sharpness and facility of motion, and by immobility and difficulty of motion, which give variety to forms, and cause things which have the same form, not to differ by magnitude alone. For the magnitude of planes makes the largeness or smallness of parts in bodies; since the parts of them are called elements. Thus the pyramids of fire from which fire consists are the parts of fire, and octaedra are the parts of air. For the octaedron is greater than the pyramid, both being generated from an equal triangle. But the composition together with so great a multitude make the acute and the obtuse. For more or fewer triangles coming together, an angle either acute or obtuse

sive qualities, works and powers; for we say that of every thing which has a natural subsistence, there are works, passive qualities, and powers; in the first place we must speak concerning these, that having made them the subject of contemplation, we may assume the differences of each with respect to each."

CHAPTER V.

HAVING therefore shown the concord between those two great luminaries of philosophy, Plato and Aristotle, in their principal dogmas; I shall in the next place proceed to develop the doctrines of the latter of these philosophers, beginning according to his own method with his Physics, and ending with his Metaphysics.

In the first place, Aristotle says in chap. ii. of the first book of his Physics, "That it is necessary there should either be one principle, or more than one: and if one, that it should either be immoveable as Parmenides and Melissus say, or moved as the natural philosophers assert, some of whom say, that the first principle is air, and others water. But if there are more principles than one, it is necessary that they should be either finite or infinite; and if finite and more than one, that they should be either two or three, or four, or some other number. But if infinite it is requisite that either they should be as Democritus asserts, one in genus, but different in figure or species, or also contraries. In a similar manner likewise they enquire, who investigate the number of beings. For they

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tuse is generated; an acute angle indeed from a less, but an obtuse from a greater multitude. But the characteristic property of the planes, produces facility or difficulty of motion; these planes existing in a compact state, through similitude, but being prepared for tendency through dissimilitude. Large pyramids therefore do not belong to things which refrigerate, but to the larger parts of fire; just as larger octaedra belong to the larger parts of air, and larger icosaedra to larger parts of water. For from this cause, waters are thin and thick, and airs are attenuated and gross. For that these are determined by quantity is evident.

they enquire in the first place, whether the things of which beings consist are one or many; and if many, whether they are finite or infinite. So that they enquire with respect to principle and element, whether they are one or many. To consider therefore, whether being is one and immoveable, does not belong to the speculation concerning nature." As it is impossible that what is here said by Aristotle can be better elucidated than it is by Simplicius, I shall present the reader with his comment on this passage, at the same time observing that Simplicius in this comment has unfolded the treasures of antiquity on the subject of the principles of physiology; and that the extracts which he gives from the lost writings of the ancients are no where else to be found.

"It follows in the next place, to enquire if there are principles of natural things, and then what and how many they are. For this is the order of problems, which is delivered by Aristotle, in his books of Demonstration[7]. But that there are principles of physical things, all natural philosophers accord in asserting, though they investigate what they are. For those who make being the object of their investigation, say, that they enquire concerning the principle of being; since those who philosophize concerning principles, investigate them as the principles of being. And some, indeed, indefinitely, not distinguishing natural things from such as are above nature. But others distinguish them, as the Phythagoreans, Xenophanes, Parmenides, Empedocles, and Anaxagoras, but through their obscurity cause the multitude to be ignorant of this. Hence, *Aristotle contradicts them as regarding their apparent meaning, giving assistance, by so doing, to those who superficially understand their assertions.* At the same time likewise that he shows there are such and so many principles, he demonstrates that there are principles. As, therefore, there are principles, Aristotle having shown that the knowledge concerning principles is necessary, and having delivered the mode of proceeding to them, he conceives it to be reasonable, not to unfold his own opinion about them, till he has considered the opinions of the ancients; hence, assuming a divisive axiom, that there is either one principle, or many principles. For through the axiom of contradiction it is necessary either that there should be one or not one; but if not one, that there should be many; and if one, says he, it is again necessary that this one should either be immoveable or moved. He afterwards subjoins to the members of the division, the opinions which are to be previously discussed. For there is either one immoveable principle, as Parmenides and Melissus appear to say, or one moveable principle, as the natural philosophers assert. But if there are many principles, they are either finite, or infinite in number. And if they are finite, they are either two or three, or some other definite number. But if infinite, they are either homogeneous, or of opposite genera. As, however, it is possible, with respect to those who assert that there is one principle, to divide them into those who say it is infinite, and into those who say it is finite, and as it is also possible to divide the many principles into the moved or immoveable, Alexander says, that Aristotle subjoins to each part of the division that which is more appropriate. But it is more appropriate to one principle to be moved or not; and to many principles to be finite or infinite.

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[7] Viz. In his Posterior Analytics.

Comprehending, however, all the opinions of the ancient philosophers, from a more perfect division, we may thus accede to the meaning of Aristotle. It is necessary, therefore, that there should either be one principle, or not one, i. e. more than one. And if one, that it should either be immoveable or moved, And if immoveable, that it should either be infinite, as Melissus the Samian, appears to say; or finite, as Parmenides the Elean, seems to assert; these philosophers not speaking about a physical element, but about true being. But Theophrastus says, that Xenophanes the Colophonian, the preceptor of Parmenides, asserted, that there is one principle, or in other words, the one which is being [8] and all, and is neither finite nor infinite, neither moved nor at rest; Theophrastus at the same time acknowledging, that the recording this opinion belongs rather to another narration than that concerning nature. For Xenophanes says, that this one and all is the divinity, whom he shows to be one, from his being the most powerful of all things. For, says he, since beings are many, it is in like manner necessary that there should be a ruler over all. But the most powerful and best of all things is God. He likewise shows that this one is unbegotten, from the necessity of that which is generated, being generated either from the similar or the dissimilar. But the similar, says he, is not passive to the similar; because it no more belongs to the similar to generate, than to be generated by the similar. And if it were generated from the dissimilar, being would be from non-being. And thus he demonstrates that it is unbegotten and eternal. He likewise shows that it is neither infinite nor finite. For it is not infinite, because it has neither beginning, nor middle, nor end; nor finite, because it is the many which mutually bound each other. In like manner, also, he takes away from it motion and rest. For he says, that non-being is immoveable, because neither can any thing else approach to it, nor it to any thing else; and it is the many that are moved, for one thing changes into another. So that when he says, it abides in the same, and is not moved, but nothing which is moved abides in the same, and that it does not proceed, since if it did it would be differently moved at different times, he does not say that it abides according to the rest which is opposed to motion, but according to that which is exempt from motion and rest. But Nicholas Damascenus, in his treatise Concerning the Gods, relates that Xenophanes asserted the one principle to be infinite and immoveable; but Alexander says, that he celebrated it as finite and spherical. However, that he demonstrated it to be neither infinite nor finite, is evident from what has been said. But he asserted it to be finite and spherical, through its being on all sides similar. He likewise affirms that it understands all things; for he says,

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[8] Viz. The summit of the intelligible order. See the Introduction and Notes to my translation of the Parmenides of Plato.

> All things with mind it shakes, from mental toil
> Remote.———

But of those who say that there is one immoveable principle, whom

Aristotle calls properly natural philosophers, some say that it is finite, as Thales the Milesian, and Hippon, who appears to have been an atheist; and call the principle water, being led to this from the sensible phenomena. For the hot lives by the moist, and things which are about to perish become dry. The seeds likewise of all things are moist; and all aliment is juicy. But that from which a thing derives its being, from this it is naturally adapted to be nourished; and water is the principle of a moist nature, and is connective of all things; on which account they apprehended water to be the principle of all things, and affirmed that the earth is situated under water. But Thales is said to have been the first who unfolded to the Greeks the history of nature; and though, as it appears to Theophrastus, there were many others prior to him, yet he very much differed from them, and eclipsed all his predecessors. He is said, however, to have left nothing in writing, except what is called his Nautical Astrology. Hippasus the Metapontine, and Heraclitus the Ephesian, admitted that there is one moveable and finite principle, but they said that it is fire; and they asserted that all things are from fire, through the assistance of rarity and density. They also again dissolved all things into fire, as if this were the one subject-nature of things. For they said, that there is a vicissitude of fire. But Heraclitus made all things to subsist, together with a certain order and definite time of the mutation of the world, according to a certain fatal necessity. And these philosophers, indeed, from surveying the vivivic, demiurgic, digestive, universally pervading and alterative nature of heat, entertained this opinion. Hence, conformably to this opinion, they did not admit this principle to be infinite. Again, if an element is the least from which other things are generated, and into which they are resolved, but fire is the most attenuated and subtle of other things, this will be especially an element. And these, indeed, are those who asserted that there is one moveable and finite element of things.

But of those who say that there is one moveable and infinite principle, Anaximander the Milesian, the son of Praxiades, and who was the successor and disciple of Thales, said, that the infinite is the principle and element of beings; he being the first who introduced this name of principle. But he says, that it is neither water, nor any other of those that are called elements, but another certain infinite nature, from which all the heavens, and all the worlds they contain, are produced. He also said, that into those things from which beings are generated, beings ought also to be corrupted. For, employing more poetic language, he says, that alternate generations and corruptions are assigned to some things, and that punishment is inflicted on injustice according to the order of time. But it is evident, that he, surveying the mutation of the four elements into each other, did not think fit to make one of these the subject of things, but something else besides these. He, therefore, did not conceive that generation is effected from the alteration of the elements, but from the separation of contraries, through an eternal motion. On which account also Aristotle ranks him among the followers of Anaxagoras. But Anaximenes the Milesian, the son of Euristrates, and who was the associate of Anaximander, says, that there is one infinite subject-nature, in the same manner as Anaximander, yet not indefinite, as he said it was, but definite, and which he calls air. He also asserts, that things differ in rarity and density according to their essences; and that when this subject-nature is divided, fire is generated; but when it is condensed, wind; afterwards a cloud; when still more condensed, water; afterwards, earth, and afterwards, stones. But he says that other things are produced from these. He likewise makes motion to be perpetual, through which also mutation is produced. And Diogenes Apoloniates, indeed, who was nearly the most recent of those who applied themselves to these speculations, wrote many useful things, sometimes speaking according to the doctrine of Anaxagoras, and at other times according to that of Leucippus. He also says, that the nature of the universe is air, and that it is infinite and perpetual; from which being condensed and rarified, and changing its qualities, the form of other things is produced. And these things, indeed, Theophrastus relates concerning Diogenes. One of his writings also came into my hands, inscribed 'Concerning Nature,' in which he clearly says, that air is that from which all things

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are generated. Nicolaus, moreover, relates that he adopted an element between fire and air. And these philosophers, indeed, conceived that the easily passive and alterative nature of air is adapted to mutation. Hence they did not think fit to admit earth as a principle, because it is with difficulty moved and changed. And thus are those divided who said that there is one principle only.

But of those who said that there are many principles, some asserted that the principles are finite, and others that they are infinite in number. And of those who contended that they are finite, some said they are two; as Parmenides in his writings, according to opinion, viz. fire and earth, or rather light and darkness; or, as the Stoics say, God and matter; not indeed calling God a principle as an element, but as that which is effective, and matter as that which is passive, But some, as Aristotle, said that there are three principles, matter, and the contraries (form and privation). According to others, as Empedocles the Agrigentine, there are four, who was not much posterior in time to Anaxagoras, and was allied to and emulous of Parmenides, and still more of the Pythagoreans. But he made four corporeal elements, fire and air, water and earth; which are, indeed, perpetual in multitude and paucity, but are changed according to mixture and separation: and he asserted, that the proper principles by which these are moved, are friendship and strife. For it is necessary that elements which are moved should be alternately disposed, at one time being mingled by friendship, and at another, separated by strife. So that according to him there are six principles. For he gives a productive power to friendship and strife, when he says,

> By friendship's aid, we sometimes into one
> All things collect; and sometimes strife detains
> All things apart, discordant borne along.

He also then arranges these two as co-ordinate to the four elements, when he says:

> Oft many things to one their being owe,
> Fire, water, earth, and air immensely high;

And each with equal power is found endued,
When strife pernicious is from each apart,
And friendship equalised in length and breadth.

And Plato, indeed, establishes three principles properly so called; viz. that which produces, the paradigm, and the end; and also three concauses, matter, form, and the instrument. But Theophrastus, after having given the history of other philosophers, says that Plato succeeded these, being prior to them in renown and ability, but posterior in time; and that though he for the most part directed his attention to the first philosophy, yet he also gave himself to the phenomena, and slightly meddled with the history of nature; in which he wished to introduce two principles, the one a subject, as matter, which he denominates the universal recipient, and the other a cause and mover, which he suspends from a divine nature, and the power of the good. And some, indeed, have extended principles as far as to the decad, though not elementary principles. Thus the Pythagoreans said, that numbers from the monad, as far as to the decad, are the principles of all things, or the ten co-ordinations[9] which different persons have differently described. And after this manner are those divided who said that principles are many and finite in multitude.

But of those who said that they are infinite in multitude, some asserted that they are simple, not homogeneous, and contraries. but characterized by that which predominates. For Anaxagoras, indeed, the Clazomenian, the son of Egesibulus, and who was a partaker of the philosophy of Anaximenes, first transmuted the opinions concerning principles, and supplied the deficient cause, making the corporeal principles to be infinite. For he said, that all those things which have similar parts, such as water, or fire, or gold, are unbegotten and incorruptible; and that they appear to be generated and corrupted through mixture and separation alone; all things, indeed, being in all, but each being characterized by that in it which predominates. For according to him, that appears to be gold in which there is much of a golden nature, though all things are inherent in it. Anaxagoras, therefore, says that in every thing there is a part of every thing; and this, Theophrastus observes, Anaxagoras says conformable to Anaximander. For he says, that things of a kindred nature tend to each other in the separation of the infinite; and that gold was generated from a separation of the gold which was in the universe, earth by a separation of earth; and in like manner each of the rest, as not being generated, but having had a prior subsistence. Anaxagoras also asserted, that intellect is the cause of the motion and generation of things, by which, being separated, they generated the worlds, and the nature of other things. Whence, says Theophrastus, if the assertions of Anaxagoras are thus considered, he may appear to have made infinite material principles, and that there is one cause, viz. intellect, of motion and generation. But if any one should apprehend that the mixture of all things is one nature, indefinite both according to form and according to magnitude, it will happen that, he says, there are two principles, the nature of the infinite, and intellect. So that he appears to have introduced corporeal elements similar to Anaximander.

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[9] These ten co-ordinations, according to Aristotle, in the first book of his Metaphysics, are as follow: Bound, the infinite; the odd, the even; the one, multitude; right hand, left hand; the masculine, the feminine; the quiescent, that which is in motion; the straight, the curved; light, darkness; good, evil; the square, the oblong.

But Archilaus the Athenian, with whom also they say Socrates associated, having been the disciple of Anaxagoras, in his treatise on the Generation of the World, and in his other writings, endeavoured to introduce some peculiar doctrine of his own. He admitted, however, the same principles as Anaxagoras. These philosophers, therefore, say, that principles are infinite in multitude, and of dissimilar genera; at the same time asserting that they consist of similar parts; but through what cause they were of this opinion, Aristotle will shortly inform us. For denying that there is generation, because that which is generated must necessarily be generated either from being or from non-being, and each of these being impossible, they ascribed apparent generation and corruption to mixture and separation. But Leucippus the Elean, or the Milesian, for he is said to be either of these, having been a partaker of the philosophy of Parmenides, did not proceed in the same way with

Parmenides and Xenophanes concerning beings, but, as it seems, in a contrary path; for they made the universe to be one, immoveable, unbegotten and finite, and did not even admit the investigation of non-being; but he asserted that the elements of things, viz. atoms, are infinite, and always moved, and that there is an infinite multitude of figures in them, because, without figure, nothing is this more than that; surveying this never-failing generation and mutation in beings. He also asserted, that being had not more a subsistence than non-being, and that both are similarly causes to generated natures. For having adopted the hypothesis, that the essence of atoms is the solid and the full, he said this is being, and that it is moved in a vacuum, which he called non-being, and which he says is not inferior to being. In a similar manner also, his associate Democritus the Abderite, established as principles the full and the void; one of which he calls being, and the other non-being. For considering atoms as matter to beings, they generate other things from the differences of these; and these are three, *ruthmos*, *trope*, and *diathige*, viz. *figure*, *order*, and *position*. For, say they, the similar is naturally adapted to be moved by the similar, and kindred beings naturally tend to each other. Each of the figures likewise being arranged into a different mixture, produces a different disposition. So that, since the principles are infinite, they very properly declare that they can assign all qualities and essences, together with that from which and how they are produced. Hence they say, that all things happen according to reason, to those alone who admit that there are infinite elements, and who say, that the multitude of figures in the atoms is infinite, because without figure nothing is more this than that; for they assign this as the cause of infinity. Metrodorus also, the Chian, nearly adopted the same principles as the followers of Democritus, asserting, that the full and the void are the first causes of things, of which the former is being, but the latter non-being; but about other things he introduced a method peculiar to himself. Such then is the concise account of what is handed down to us by history concerning principles, not written, indeed, according to time, but according to the agreement of opinion. It is not, however, fit to think, on hearing these differences, that they are the contradictions of those who philosophized, which some meeting with merely historical writings, and understanding nothing which they relate, endeavour to defame; though they are themselves divided by an infinity of dissentions, not about physical principles, for of these they have not even a dreaming perception, but about the subversion of the divine trancendency[1].

It may not perhaps, however, be improper digressing a litttle, to show the more studious how the ancients, though they appear to differ in their opinions concerning principles, yet at the same time harmoniously agree. For some of them spoke concerning the intelligible and first principle, as Xenophanes, Parmenides, and Melissus. And Xenophanes, indeed, and Parmenides, called it one and finite: for it is necessary that the one should subsist prior to multitude; that the cause of bound and termination to all things, should rather be defined according to bound than infinity; and that the every way perfect, and which has received its proper end, should be finite; or rather that it should be the end and principle of all things: for the imperfect being indigent, has not yet received termination. Except, indeed, that Xenophanes considers this principle as the cause of all things, as transcending all things, and as beyond all motion and rest, and opposite arrangement, in the same manner as Plato in the first hypothesis of his Parmenides. But Parmenides, beholding this principle as subsisting according to sameness, and in a similar manner, and as beyond all mutation, and perhaps energy and power, celebrated it as immoveable and alone, as being exempt from all things, as when he says:

> The one immoveable has every name.

Melissus too, in a similar manner, surveyed the immutable, but asserted that it was infinite, as well as unbegotten, according to never-failing essence, and infinite power. But this is evident, from his demonstration concerning the infinite, which is framed according to the following conception.

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[1] Simplicius, in what he here says, alludes to the Christians, and most propably to their disputes about the Trinity.

ception. For he says, "Since, therefore, it was not generated, it is, and always was, and will be; and has neither beginning nor end, but is infinite, for if it were generated, it would have a beginning; since that which was once generated must have a beginning and an end. For it will die. But since it neither began to be, nor will die, but always was, it has neither beginning nor end, but is infinite." Thus, therefore, Melissus looking to that which according to time is without beginning and end, and perpetual being, asserts that this principle is infinite. Parmenides also testifies a thing of this kind concerning it, when he says, in nearly the same words:

Being is unproduced, without decay,
Unshaken, single, whole, without an end.
Nor once it was, nor will hereafter be,
Since it is now one simultaneous all.

After this manner, therefore, he says that it is never-failing, unbegotten, and infinite. But he manifests the conception of bound by the following verses:

Same in the same, and by itself abides,
So firm it there remains, held in the bonds
Of bound, by strong necessity, on every side.
Unlawful hence, that being without bound
Should e'er remain; for want it never knows.
But to non-being perfect want belongs.

For if it is being, and not non-being, it is unindigent; but being unindigent it is perfect: and being perfect, it has an end, and is not unfinished. But having an end, it possesses bound and limitation. Thus, therefore, according to the conception of these men, there is no contrariety in their assertions concerning this principle.

But Parmenides passing from intelligibles to sensibles, or, as he says, from truth to opinion, in the following verses:

Here about truth firm thoughts and reasonings end;
Opinions human now attentive learn,
Clothed in fallacious ornament of words.

He established as the first elementary principles of generated natures, the first opposition, which he calls light and darkness, fire and earth, or the dense and the rare, or same and different, as is evident from the verses which follow those just recited:

Names they to forms from two opinions give,
Improper one, in which they wander wide.
Opposing natures separate they rank'd,
Body and signals, each from each apart.
Hence, in one class, etherial flaming fire,
Mild, rare, and light, and like itself throughout
They ranged; but in the class oppos'd to this,
A nature wholly contrary they plac'd,
Body nocturnal, gravitating, dense.

The meaning of Parmenides in these verses appears to be in prose as follows: In the one series, there is the rare and the hot, the luminous, the soft, and the light; but in the dense are denominated the cold and the dark, the hard and the heavy: for, in these, each is separated from the other. After this manner, therefore, he plainly assumes two elements opposed to each other. Hence, prior to this he separates the *one being*, and says, that they err who do not perceive the opposition of the elements which compose generation, or who do not clearly unfold it. And Aristotle, following Parmenides, establishes the principles of things to be contraries. Parmenides also clearly delivers the producing cause, not only of the bodies which are in generation, but also of the incorporeal natures which give completion to generation, when he says:

But these to night belong; resplendent fate
Succeeds; and in the midst the power divine
Who governs all; for he of hateful births
And copulation is the source. He sends
The female with the male to mix; and then
The male again, the female to embrace.

Empedocles also teaching us concerning the intelligible and the sensible world, and establishing the former as the archetypal paradigm of the latter, places in each, as principles and elements, these four:

fire, air, earth, and water; and as producing causes, friendship and strife: except that things in the intelligible world, being vanquished by intelligible union, are said to be rather collected together by friendship; but things in the sensible world to be rather separated by strife. And with him Plato accords, or, prior to Plato, Timæus, who says, that in the first intelligible paradigm, four ideas pre-subsist, characterized from the four elements, and producing this sensible world, distributed into four parts, among the last of things; strife here having dominion, through a separation, departing from intelligible union. Empedocles also speaks in common about both worlds, except that placing the elements in the ratio of matter, he surveys about them the contrariety of friendship and strife. For that friendship alone did not, as the vulgar think, produce, according to Empedocles, the intelligible world, nor strife alone the sensible world; but that he surveyed both every where, in an appropriate manner, is evident from what he says in his Physics, in which he asserts that Venus, or friendship, is the cause of the comixture which is here. But he calls fire, Vulcan, the sun, and flame; but water he calls rain; and air, æther. And he says these things, indeed, in many places, and also in the following verses:

All-shining æther, Vulcan, showers of rain,
Earth above all things, equally obtains,
Establish'd in fair Venus perfect ports;
Whether the small to great, or more to less is chang'd,
Blood, and the forms of other flesh, from these were made.

And prior to these verses, he delivers in others the energy of both these, in the same things, as follows:

When at the bottom of the whirlpool deep
Strife had arriv'd, and Love was in the midst,
All things in this were gather'd into one,
And, from their mixture, countless mortal tribes
Arose, tho' many things unmingled stood,
Which strife in durance had detain'd on high.
For to the utmost limits of the orb,
Not without blame, the universe withdrew.

But of its members some remain'd within,
And some departed from the mingled whole.
Whate'er too Strife's victorious force destroy'd,
This blameless Love with all-propitious aid,
Immortal impulse! constantly restor'd.
Then instant mortal natures that before
Had learnt to be immortal, sprung to light.
Unmingled once and pure, they chang'd their paths;
And from their mixture countless mortal tribes
Arose, of forms all-various, wond'rous to the view.

In these verses, he clearly says, that mortal natures were harmonized from friendship; and that in those in which friendship has dominion, strife was not yet perfectly exterminated. In those verses also, in which he clearly delivers the marks or tokens by which the four elements are known, as likewise friendship and strife, he indicates the mixture of these two in all things. But the verses are as follow:

Dark and tremendous rain in all is seen [1],
But trees and solids from the earth are pour'd.
In wrath all biform'd natures separate lie,
But in love mingling, for each other burn.
From these what was, is, will be, is deriv'd:
From these trees blossom, men and women spring,
Beasts, birds, and fishes that in water live,
And long-liv'd Gods, transcendantly renown'd.

And again, shortly after, he adds:

In part they govern the revolving orb,
Into each other perish, and by turns
Of fate increase, for such their nature is.
But, thro' each other, when again they run,
Then men arise, and countless ills beside.
Into one world they now together come
Thro' friendship; each divided borne along
Is now by strife subdued. And while these two

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[1] There are two lines prior to this in the original; but in their present state they are not intelligible: for this reason I have not attempted to translate them.

> Connascent are, the whole beneath, is born.
> Alternate hence, from many one is form'd,
> And many to perfection rise from one.
> Hence, as begotten, not to these belongs
> Stable eternity; tho' chang'd howe'er throughout,
> Yet, since the change is endless, they remain
> Immoveable in one eternal orb.

So that the subsistence of one thing from many, which happens through friendship, and of many from one, which is effected by the domination of strife, Empedocles also surveys in this sublunary world, in which mortal natures exist according to periods that are different at different times; at one time strife, and at another time friendship having dominion. Perhaps too, he delivers a certain procession of the union and separation of beings, obscurely signifying the many differences of the intelligible above this sensible world, according to the more or less domination of friendship; and in the sensible world shows the differences of the dominion of strife comprehended in certain bounds, as in other parts of his poem he endeavours to demonstrate; except that he also does not assert any thing contrary to Parmenides and Melissus, but as well as Parmenides surveyed the elementary opposition. Parmenides also admitted that there is one common efficient cause of all generation, which is established in the midst of all things, and which cause is a divine power; but Empedocles surveyed the opposition in the efficient causes.

But Anaxagoras the Clazomenian, appears to have surveyed the triple difference of all forms, one, contracted in intelligible union, as when he says, "All things were together infinite, both in multitude and smallness." And again, "Before these were separated, all things subsisting together, no one colour was apparent. For the mixture of all things prevented this, viz. of the moist and the dry, the hot and the cold, the splendid and the dark, being abundantly inherent, together with seeds infinite in multitude, none of which resembled each other. But things thus subsisting, it is necessary that all things in the universe should appear to be one." This *universe*, therefore, or *all* of Anaxagoras, will be *the one being* of Parmenides. But Anaxagoras appears to have surveyed another difference, distinguished according to intellectual separation, to which the difference in the sensible world is assimilated: for a little after the beginning of his first book Concerning Nature, he says as follows,: "Things thus subsisting, it is necessary that many and all-various things should appear to be one in all things which are collected together. Likewise, that there should be the seeds of all things, possessing all-various ideas, colours, and pleasures. Also that men, and such other animals as possess a soul, should be mingled with each other; together with cities inhabited by men, and works such as are among us, Likewise, that the inhabitants there should have a sun and moon, and whatever else we possess; and that the earth should produce for them many and all-various things, which they necessarily employ to the useful services of their habitation." And thus much I have said concerning the separation of things, because not only the things which are with us are separated according to Anaxagoras, but also others. Perhaps, indeed, he may appear to some not to compare the separation which is in generation with that which is intellectual, but to contrast our habitation with other places of the earth. If this, however, were the case, he would not have said concerning other places, that they had a sun and a moon, and other things such as are with us; nor that they had seeds there, and the ideas of all things. Let us also hear what he says a little after, when he makes a comparison of both: "Thus, therefore, departing and being separated by force and swiftness; swiftness produces force. But their swiftness does not resemble the swiftness of any thing which is now among men, but is entirely multifariously swift." If, therefore, Anaxagoras had this conception, he says, that all things are in all; in one way according to intelligible union; but in another according to intellectual connexion; and in another according to sensible conspiration, and generation from the same, and analysis into the same.

Again, Leucippus, Democritus, and the Pythagoric Timæus, are not adverse to the dogma, that the four elements are the principles of composite bodies. And they, as well as the Pythagoreans, Plato and

Aristotle, surveying the mutations of fire, air, water, and perhaps of earth also, into each other, investigated certain more principal and simple causes of these, through which also they defended the difference of these elements according to qualities. Thus, indeed, Timæus, and Plato according with him, consider superficies possessing a certain depth, and differences of figures, as the first elements of the four elements, and are of opinion that a corporeal nature in conjunction with corporeal figures, has a more principal subsistence, and is the cause of the differences of qualities. But Leucippus and Democritus, calling the least first bodies atoms, were of opinion that they differed according to the difference of figure, position, and order; and they denominated those bodies hot and fiery which are composed from more acute and attenuated first bodies, and situated in a similar position. But they said, that those bodies were cold and watery which are composed from first bodies contrary to those just mentioned; and also that some of these atoms are splendid and luminous, but others obscure and dark.

With respect to such also as asserted that there is one element of things, as Thales, Anaximander, and Heraclitus, each of these directed his attention to the efficacious nature, and aptitude to generation of this element. Thales, indeed, to the prolific, nutritive, connective, vital, and easily-to-be-fashioned nature of water; but Heraclitus to the vivific and demiurgic nature of fire; and Anaximenes to the plastic nature of air, and its easily receding on both sides, viz. to fire and to water. Just as Anaximander also directed his attention to a middle element, through its being easily susceptible of mutation. Thus, therefore, some looking to the intelligible, but others to the sensible order; some investigating the proximate elements of bodies, and others those which have more the relation of a principle; some considering that which is more partial, and others that which is more total in an elementary nature; and some investigating elements alone, but others all causes and con-causes, assert *different* things in physiologizing, but not such as are *contrary*, to him who is able to judge. Aristotle himself also, who seems to have indicated their dissonance, says, a little farther on, that they differ from each other, because some assume prior, and others posterior principles; some, things more known according to reason, and others, according to sense. So that, says he, in a certain respect their assertions are the same with, and different from each other. But I have been compelled to be thus prolix, on account of those who are readily disposed to object to the ancients a disagreement in their opinions.

Since, however, we shall hear Aristotle confuting the opinions of the more ancient philosophers, and, prior to Aristotle, Plato appears to have done this, and still prior to both these, Parmenides and Xenophanes, it must be observed that they, directing their attention to superficial readers, confute the apparent absurdity in the assertions of those philosophers, *it being usual with the ancients to exhibit their opinions enigmatically.* Plato evinces the truth of this, by so much admiring Parmenides, whom he seems to confute, and when he says that his conceptions require a profound diver[2]. Aristotle also appears to have suspected the profundity of his wisdom, when he says Parmenides seems to have seen this. Hence Plato and Aristotle, at one time supplying what the ancients have omitted, and at another time rendering conspicuous what they obscurely assert; at one time separating what is said of intelligibles, as not being able to adapt it to physics, as when the ancients call being one and immoveable, and at another time repressing the easy interpretations of the more superficial, thus appear to confute them.

Aristotle, having spoken concerning those who assert that there is one physical principle which subsists as a subject, and having delivered the difference, according to the twofold mode of generation, from this subject, viz. that according to change in quality, and that according to separation, he proceeds, in the next place, to Empedocles and Anaxagoras, who said, that the principle is both one and many: for Anaxagoras, introducing things of similar parts as subject principles, said, that these are infinite. He also said, that the producing cause is one, which is separating intellect. But Empedocles introduced as many subject principles, the four elements, but one efficient, friendship and strife; because each of them has dominion, and produces alternately, and not both at once: for thus, there is always, according to him, one efficient. Or shall we say, that they did not assert there is one efficient principle, but the mixture itself, which, according to Anaxagoras, is mingled from things of similar parts, infinite in multitude; but according to Empedocles, from the four elements, at one time mingled together by friendship, and at another separated by strife, and producing this world? But Theophrastus, classing Anaxagoras with Anaximander, considers what is asserted by Anaxagoras, as if he admitted one subject nature: for Theophrastus, in his Physical History, thus writes: "Since Anaxagoras admits these things, he may appear, as we have said, to make infinite material principles, but one cause of motion and generation. But if any one apprehends that the mixture of all things is one nature indefinite, both according to form and according to magnitude, which he may seem to be willing to say, it happens that he will assert there are two principles, the nature of the infinite, and intellect; so that it will entirely appear that he introduces corporeal elements, similar to Anaximander." But Aristotle very properly, after those who assert that there is one principle, and this either immoveable or moveable, ranks those who say there is one and many principles, prior to those who seem to say that there are many alone, as Democritus and his followers: for these have a middle order. But those who assert that there is one principle, have something in common with those who make generation from co-mixture and separation. And Anaxagoras is more allied to those who suppose that the generation of things is effected by separation. But they differ from those who say there is only one principle, because they assert that there is both one and many; but they differ from each other, in the first place, because Anaxagoras says, that the world, being once generated from the mixture, remained afterwards governed and separated by presiding intellect: but Empedocles supposes that the world subsists alternately, according to certain periods, at one time the mixture of the four elements being effected by friendship, and at another time their separation by strife. And in the second place, they differ from each other, because Anaxagoras supposes that the many principles from which the universe consists, are infinite, and of similar parts; but Empedocles supposes that they are finite; for they are what are called the four elements.

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[2] See the Theætetus of Plato.

But that Anaxagoras (Simplicius adds) asserts that infinite things of similar parts are separated from a certain mixture, all things being in every thing, but each being characterized by that which predominates, is evident from the first book of his Physics, in the beginning of which he says, "All things were together, infinite both in multitude and smallness: for the small was infinite. And all things subsisting together, nothing was manifest through its smallness: for air and æther contained all things, both being infinite; since these which are the greatest both in multitude and magnitude, are inherent in all things." And shortly after he observes, "For air and æther are separated from that which abundantly contains, and that which contains is infinite in multitude." And soon after he adds: "This being the case, it is requisite to see that there are many and all-various things in all the mutual mixtures, and seeds of all things, possessing all-various ideas, colours and pleasures. But before they were separated, in consequence of all things subsisting together, no one colour was manifest: for the commixture of all things prevented this, viz. of the moist and the dry, the hot and the cold, the splendid and the dark, much earth also being inherent, and infinite seeds, in no respect dissimilar to each other. For of other things which were there, one did not appear to be different from the other." But that no one of these things of similar parts, is either generated or corrupted, but is always the same, he manifests as follows: "These being thus separated, it is requisite to know that all things are neither less nor more; for neither is it easy to be more than all things. But all things are always equal."

This is what Anaxagoras says concerning the mixture, and things of similar parts. But concerning intellect he writes as follows:

"Intellect is infinite and self-ruling, and is mingled with nothing, but is itself alone by itself; for if it were not by itself, but was mingled with any thing else, it would participate of all things; for in every thing, a part of every thing is inherent, as I have observed before; and the things mingled with it would be an impediment to its similarly ruling over all things: so that it subsists alone by itself. It is, indeed, the most attenuated, and the purest of all things, and possesses a universal knowledge of every thing, and the greatest power. It likewise rules over all such things as have a soul, and are greater and less. Every thing too that comprehends, is subject to its dominion, so that it even comprehends the principle itself. And first of all, indeed, it began, from that which is small, to exercise its comprehending power; but afterwards it comprehended more and more abundantly. Intellect also knew all that was mingled together, and separated, and divided, together with what they would be in future, what they had been, and what they now are. All these intellect adorned in an orderly manner, together with this circular enclosure which now consists of the stars, the sun and the moon, the air and the æther, which are separated from each other. It likewise, separated the dense from the rare, the hot from the cold, the lucid from the dark, and the dry from the moist. There are many parts, indeed, of many things: but, in short, no one thing is separated from another, except intellect. Every intellect, too, is similar, both the greater and the less; but no other thing is similar to another. Since, however, many things are inherent in one thing, each individual is, and was manifestly these."

But that he admitted that there is a twofold order, one intellectual, and the other sensible, proceeding from the intellectual, is evident from what has been said, and is also evident from what follows: "But intellect was in the highest degree such things as these[3], and now is; that every thing else might subsist in that which comprehends a multitude, and in conjunctions and separations." Having likewise said, that there are many and all-various things in all the mixtures, and the seeds of all things, possessing all-various ideas, colours, and pleasures, and that men are mingled together, and other animals endued with soul, he adds: "With men also cities are conjoined, and works are provided, such as are with us. They have also a sun and moon, and other things such as we possess. The earth also affords them many and all-various productions, which are used by them, after they have brought them into their habitations, as things most advantageous." And that he obscurely signifies another order of things, different from that which is with us, is evident from his saying, not once only, "*Such as are with us.*" Likewise, that he did not conceive that sensible order to precede this in time, is evident from the words, "are used by them, after they have brought them into their habitations, as things most advantageous:" for he does not say, *they were used by them*, but, *they are used by them.* Neither does he speak as with reference to certain other habitations, which resemble the constitution of things with us: for he does not say, *there is a sun and moon with them, just in the same manner as there is with us*; but, "*that they have a sun and moon as we have.*" Whether, however, these things are so or not, deserves to be investigated.

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[3] By this Anaxagoras meant to insinuate that all things subsist *causally* in intellect; viz. that corporeal natures subsist in it incorporeally; and every thing, in short, according to a more excellent condition, than when considered by itself, or such as it essentially is.

But Empedocles asserted, that there is one principle and many finite principles, a periodical restoration of things, and generation and corruption, according to commixture and separation, as is evident from the following verses, in the first book of his Physics.

——————— Twofold I say:
For now from many one alone increas'd,
And then the many from the one arose,
And mortals were assign'd their birth and their decay.
For this, the congress of the whole of things
Led forth to light, and when produc'd, destroy'd;
And this when forms have into life emerg'd,
Again divides them into parts minute,
And gathers them again. These two, throughout
Diversified, are doom'd to endless change.
All things in union now thro' love conspire,
And now, thro' strife divuls'd, are borne along.
Hence, when again emerging into light
The one is seen, 'tis from the many form'd.
All mortals, too, so far as they are born,
Of permanent duration are depriv'd;

But as diversified with endless change,
Thro' this unmov'd forever they remain,
Like a sphere rolling round its centre firm.
But to a fable listen, for the wit
Ebriety increases.—As before
A fable I announc'd, again I say,
That these are twofold: at one period, hence,
One thing alone from many was increas'd,
And at another many rose from one.
Fire, water, earth, and air immensely high,
With strife pernicious, from the rest apart;
And each possess'd equality of power:
While love in these had equal length and breadth.
. . . .
But to my words, devoid of guile, attend,
For all these equal are, and equal in their birth,
And nothing adventitious is, or ever fails.

In these verses he says, that there is one thing from many, i. e. from the four elements; and that at one time friendship has dominion, and at another strife: for that neither of these entirely fails, is evident from his asserting that all things are equal, and of an equal age, according to their birth, and that nothing is adventitious or fails. And not only friendship is one, but strife also is reduced to one. Asserting also many other things, he adds the character of each of the above-mentioned particulars, calling fire, the sun; air, splendor and heaven; and water, rain and the sea. That he also obscurely signified a twofold order, the one intelligible, and the other sensible, and the one divine, but the other mortal, of which the former has the relation of a paradigm, and the latter of an image, is evident from the following verses:

Dark and tremendous rain in all is seen,
But trees and solids from the earth are pour'd.
In wrath, all biform'd natures separate lie,
But in love mingling for each other burn.
From these, what was, is, will be, is deriv'd.
From these, trees blossom, men and women spring,
Beasts, birds, and fishes that in water live,
And long-liv'd gods, transcendently renown'd.

For in these verses, he not only says, that generated and corrupted natures are composed from friendship and strife, but also the gods themselves. From the following verses also, he may be supposed obscurely to signify a twofold order:

In their own parts all these envelop'd lie,
The sun, the earth, the heavens, and the sea,
With all that is adapted to be form'd
In mortal realms. In temperament, besides,
All that were more sufficient to themselves,
Venus, as similarly form'd, conjoin'd,
But hatred from each other far apart
Divides them, in their temperament and source,
And forms resemblant; since, to coalesce
Is to them strange, and bitter in th' extreme,
For, born themselves from strife, an offspring they desire.

For he manifests that these things are adapted to mortal natures; but in intelligibles they are more united, and adhere to each other, being rendered mutually similar by Venus. He also shows that these are everywhere, but that intelligibles are assimilated by friendship, and sensibles subdued by strife; and that being divulsed far apart from each other in their origin and temperament, they subsist in forms resemblant, which have the relation of images, and are produced by strife, and are unaccustomed to be united to each other. But that Empedocles also admitted generation, according to a certain mixture and separation, is evident from what he says in the beginning:

For now, from many, one alone increas'd,
And then the many from the one arose.

CHAPTER VI.

LET us in the next place direct our attention to the doctrine of the Stagirite, concerning that last and most obscure of all things, matter, previously observing that he establishes three principles of natural things, viz. matter, form, and privation, and that from the following arguments. Every generation is the production of something, through which a thing begins to be that which it was not before. Hence, that which is produced *de novo*, is the boundary to which generation tends, and is called form. Since, however, we cannot conceive any thing to be generated *de novo*, unless it had not a prior existence, hence it is necessary that a privation of the form to be produced should precede generation, which privation is the term or boundary from which generation proceeds. And because nothing can be generated or produced by the power of nature from nothing, hence a third thing is requisite, from which form itself may be generated, and into which it may be received, which principle of generation is called matter. Hence, we infer that there are three principles of natural things, of which form and privation are opposite boundaries; but matter is the common subject of each.

"The subject nature then, [i. e. matter] says Aristotle[4], may be scientifically known according to analogy: for as is the brass to the statue, or the wood to the bed, or matter and that which is deprived of form to any thing else which possesses form, before it receives form; so is this subject nature to essence, to this particular individual thing, and to being. This, therefore, is one principle, though it is not one, nor being in such a manner as this particular individual thing. Another principle is form; and farther still, the contrary to this, privation. But with respect to these, how they are two, and how they are more than two, has been declared above. In the first place, therefore, it has been said, that principles are contraries only; and in the next place, that it is necessary something else should be admitted as a subject, and that there should be three principles."

As Aristotle's doctrine on this subject is admirably elucidated by Simplicius, and as he also again unfolds to us the treasures of antiquity, I shall present the reader with his commentary on the above citation.

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[4] In his Physics, Book I. Chap. VIII.

"As the paradigms of matter here proposed, as for instance, man and seed, and any thing else of this kind, although they have the relation of matter to things which are generated, yet are themselves also certain forms, every one will be desirous to learn what the subject matter itself to forms will be by itself: for, let seed be the matter of man; blood, if it should so happen, of seed; of blood, meat and drink; and of these, the four elements. But since these also change into each other, according to contrary qualities, they are entirely indigent of a certain common subject, which has no quality in its own nature: for qualities are forms, and opposite forms. If, therefore, all knowledge which subsists according to affirmation, is of things circumscribed, which possess a certain character, and become definite through quality and form, but the subject to forms and qualities ought to be entirely void of quality, and formless,—if this be the case, a thing of this kind will be, says Aristotle, known in a certain respect by analogy to other things: for as brass is to a statue, or wood to a bed, or that which is formless, before it receives form, to any thing else artificial which possesses form, so in physical things is the first matter to essence and being. But Aristotle very properly takes his paradigm from things artificial; since in these also the formless precedes according to time, and is of itself visible. Essences also or substances are the subjects of other things, but matter is the subject of substance; and hence likewise matter is the subject to all other things. It is, however, essentially the subject to substance, and the composite, but to other things according to accident. Hence also Aristotle says, "Thus it subsists with respect to substance and this particular individual thing, viz. to the composite, and that which is properly substance; because matter is not yet this particular individual thing, though it is more so than privation. It is also worth while to observe, that Plato, surveying matter according to its permanency, rather assigns to it τοδε τι, *this particular individual thing*, as he evinces in the formation of golden vessels: and also when he says, "In which each of these appears to be ingenerated." And again, "that alone can be denominated, whence they perish: for in these passages, he uses the appellation *this*, and *this particular thing*.

But Aristotle, surveying this particular individual thing according to form, imparts the term *it* to forms; but after the term *this particular individual thing*, he adds, "And to being also," that is, to all things; of which some are essences, but others accidents; and some are precedaneously *this particular individual thing*, but others through this very term itself.

Plato calls this knowledge, according to analogy, spurious reasoning, because it is produced not according to the affirmation of form, but according to the denudation and negation of forms: and the reasoning power sees matter, as it were, with shut eyes; so that the intellectual perception of it is not intelligence, but rather ignorance. Hence the phantasm of it will be spurious, and not genuine: for as we know things above the first form, not according to formal affirmation; but learning from the nature of forms, which is separate, and ought to have, prior to itself, the united and the one, that they are not the first things, we know that which is above form by a negation of forms, negation not simply hurling us to its indefinite nature, but to the cause of form, and to that which is established above formal boundary: thus also surveying ultimate forms, which are images, which change into each other, and on this account require a subject capable of receiving the opposites in succession, we arrive at the conception of matter, by a negation of forms, which leads us into the receptacle of forms. But if, while investigating matter, we admit it to be some particular thing, definitely differing from other things, we shall fall upon something else, and not on matter: for matter has not any relative difference, since all formal difference is quality: so that the knowledge of matter is rather ignorance, since the things which are changed about it, being the last of forms, receive the last sensible knowledge. Hence Plato says that matter is tangible with insensibility, signifying by this its resistance not according to affirmation; that he might show that as it is apprehended by a spurious reasoning, so likewise by a spurious sense.

But Aristotle derived the term, *according to analogy*, from the Pythagoric Timæus; as did also Plato the expression, *apprehended by a spurious reasoning*: for Timæus, in his book on the *Soul of the World, and Nature,*

Nature, says, "That matter is conceived by a spurious reasoning, and not yet by a direct process, but according to analogy."

Since, however, some, and those not ignoble philosophers, say that body void of quality is the first matter, both according to Aristotle and Plato, as among the ancients, the Stoics, and among the moderns, Pericles the Lydian, it will be well to conisder this opinion: for Aristotle and Plato, first introducing matter from the mutation of things which are changed, were of opinion that the qualities of the elements are the hot and the cold, the moist and the dry; but these having a common subject body, are changed about it, so that the first matter will be body. Farther still: if there were any other subject to body, since generations are from contraries, it would be necessary that there should be some subject to body, in order that opposites may be changed about the common subject. Again, that which abides in all mutation we say is matter; but body void of quality abides; for there is not any thing into which body can be corrupted. But that Plato says that matter is the proximate subject to the qualities of the four elements, and this is body void of quality, is evident from the following words; "The nurse of generation moist and fiery, and receiving the forms of earth and air." And again, "when the demiurgus began to adorn the universe, he first of all figured with forms and numbers, fire and earth, water and air, which possessed, indeed, certain traces of the true elements, but were in every respect so constituted as it becomes any thing to be from which Deity is absent." If, therefore, the demiurgus has inserted, in matter, the first forms of the elements, and the common subject of these is body without quality, matter will be this. According to Aristotle, also, matter appears to be body without quality, and the first subject: for if body, like some one of other forms, accedes to, and departs from matter, certainly prior to its acceding, and after its departing from matter, there will be a privation of body about matter, which is the incorporeal; and there will be a certain physical incorporeal essence, which was not the opinion of Aristotle, who every where clearly asserts, that physical things are bodies, and that they subsist about bodies.

That Plato, however, was not of opinion that body is the first subject which we call matter, will be evident from this, that superficies according to him are preassumed as the elements of body, which superficies have a more principal subsistence than bodies. He thus writes, therefore, in the Timæus: "In the first place, that fire and water, air and earth, are bodies, is evident to every one; but every form of body also possesses depth; and there is every necessity that superficies should by nature comprehend depth." In the next place, body, according to Plato, possesses a triple interval; for this is signified by its possessing depth. But a thing of this kind has number co-essentialized with it, and figures, and especially if all body is finite, as it appeared to be both to Plato and Aristotle. Matter, however, says he, has of itself none of these; but when it participates of forms, then it is figured with forms and numbers. That Aristotle, also, was not of opinion that the first subject is body, he clearly evinces, when he says, "There is the same matter of a large and a small body:" for the matter of body will not be body; and that which is the same subject both to the great and the small, will neither be great nor small. But body, and especially that which is finite, is of a certain dimension; and the same body will not be of itself, at the same time, great and small. In short, body is comprehended by reason, and is affirmatively known; but matter, according to Plato, is comprehended by a spurious reason, and according to Aristotle, and prior to him the Pythagoric Timæus, by analogy alone. It is not possible, therefore, for the first matter to be body. Again, in the fourth book of these Physics, Aristotle is of opinion that matter is certain indefinite interval of magnitude, bounded by formal magnitude. He says, therefore, "So that place may appear to be the species and form of every thing, by which magnitude, and the matter of magnitude, are bounded:" for after having mentioned magnitude, since magnitude also is formal, he adds, by way of explanation, "and the matter of magnitude."

Again: to him also who considers the problem by itself, it will appear to be impossible that the first matter should be body void of quality, as also Plotinus has shown: for if no physical form is essentially inherent in matter, which is the subject to all physical forms, it is evident that neither figure nor magnitude will be inherent in it; for these are forms. And it will be invested with figure and magnitude, if it is body; so that it will no longer be any thing simple, but a composite from matter and form. Matter, however, is simple. So that you may syllogize as follows: matter neither possesses of itself magnitude, nor figure, nor number. Body possesses of itself magnitude, figure, and number. Matter, therefore, is not body. Again, matter is not a composite from matter and form; body is a composite from matter and form. Matter, therefore, is not body. Further still: if matter is body, it will have a certain proper magnitude; and the demiurgus will no longer have produced all forms from himself, according to his own will; nor nature, according to demiurgic reasons, in herself, but she will necessarily be subservient to the magnitude of matter. Again, if matter has magnitude it will also have figure in the definition of it. This, therefore, is not only absurd, because figure is form and quality, but because matter will be unadapted to receive every figure, in consequence of being vanquished by one certain definite figure. Further still: the form which proceeds into matter, brings with it every thing appropriate; so that it also brings with it magnitude, for there is one magnitude of a man, and another of a bird, and of such a particular bird. Neither magnitude, therefore, nor quantity, will be the property of matter; and, hence, matter will not be body. Again, if matter is body, it will be a certain quantum, and endued with magnitude; but a quantum is one thing, and quantity another; and that which is endued with magnitude is different from magnitude itself: and incorporeal forms are simple, but the participants of these are composites. If, therefore, matter is body, it will be something composite, and not simple, nor an element. But if these things are absurd, we must say, that quantity, being received by matter, imparts magnitude, which, prior to this, was not inherent in matter; just as quality, being participated, makes that to be *quale*, which before was void of quality. Farther still: body consists from genus and differences; for it is an essence with a triple interval; but a thing of this kind is form and not matter. Again, body is divided contrary to incorporeal qualities; but matter subsists similarly with respect to all things. Body also is defined by certain intervals; but matter is perfectly indefinite.

Such, then, being the arguments on both sides, it is manifest that the subject to forms ought not to be form; on which account, if body is form, it will not be body. However, that the nature which subsists in common in all things physical and sensible, so far as they are such, ought to be matter, is, I think, among things manifest. But it is common to all these, to be extended into bulk and interval. Hence the science concerning nature, as Aristotle says, is conversant with bodies and magnitudes, and the properties of these. May we not, therefore, admit that body is twofold, one kind, as subsisting according to form and reason, and as defined by certain intervals; but another as characterized by intensions and remissions, and an indefiniteness of an incorporeal, impartible, and intelligible nature; this not being formally defined by three intervals, but entirely remitted and dissipated, and on all sides flowing from being into non-being. Such an interval as this, we must, perhaps, admit matter to be, and not corporeal form; which now measures and bounds the infinite and indefinite nature of such an interval as this, and which stops it in its flight from being. But it is worth while to know, that it is proper matter should be that by which things material differ from such as are immaterial. But they differ by bulk, interval, division, and things of this kind, and not by things which are defined according to measure, but by things void of measure and indefinite, and which are capable of being bounded by formal measures. The Pythagoreans appear to have been the first of the Greeks that had this suspicion[9] concerning matter; but after them Plato, as Moderatus also informs us; for he, conformably to the Pythagoreans, evinced that the first one is above being, and all essence; but he says that forms are the second one, which is true being and the intelligible; and that the third one, which is psychical, or belonging to soul, participates of the one, and of forms. He adds, that the last nature from this, and which is the nature of sensibles, does not participate, but is adorned according to a representation of them, matter which is in them being the shadow of the non-being which is primarily in quantity, or rather depending on and proceeding from it. Porphyry also, in his second book 'On Matter,' after adding the opinion of Moderatus, observes, "That monadic reason being willing, as Plato somewhere says, to give subsistence to the generation of things from itself, separated quantity according to a privation of itself, depriving it of all the reasons and forms which it contains in itself. This quantity he calls formless, indivisible, and unfigured, but receiving form, figure, division, quantity, and every thing of this kind. Plato, too, says Porphyry, seems to have predicated many names of this quantity, calling it the universal recipient, formless, invisible, that it receives an efflux of the intelligible, and is scarcely to be apprehended by a spurious reason. Porphyry adds, that quantity itself, and this form which is conceived according to a privation of monadic reason, comprehending in itself the productive principles of every thing in the universe, are the paradigms of the matter of bodies, which, says he, the Pythagoreans and Plato call *quantum*, not quantum as form, but as subsisting according to privation, dissolution, extension, and separation, and through a mutation from being. Hence, also, matter appears to be evil, as flying from *the good.* It is, however, comprehended by the good, and is not permitted to depart from its boundaries, extension receiving the reason of formal magnitude, and being defined by it, but divulsion becoming specifically distinguished by arithmetical separation." According to this reasoning, therefore, matter is nothing else than the mutation of sensibles, with respect to intelligibles, deviating from thence, and carried downwards to non-being: for, that the proper bulk of sensibles is one thing, formal magnitude another, the divulsion of sensible forms another, and arithmetical separation another, is evident from these being reasons, and forms without interval and impartible: for the reason of tricubital magnitude, and also that of the triad, are without interval, impartible, and incorporeal. Those things, indeed, which are the properties of sensibles are, irrational, corporeal, distributed into parts, and passing into bulk and divulsion, through an ultimate progression into generation, that is to say, into matter; for matter is always truly the last sediment: on which account also the Egyptians call the dregs of the first life, which they symbolically denominate water, matter, being as it were a certain mire. And matter is, as it were, the receptacle of generated and sensible natures, not subsisting as any definite form, but as the state or condition of subsistence; just as the impartible, the immaterial, true being, and things of this kind, are the constitution of an intelligible nature: all forms, indeed, subsisting both here and there; but here, indeed, materially, and there immaterially; viz. there impartibly and truly, but here partibly and shadowy. Hence, every form is here distributed according to material interval.

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[9] Simplicius here in speaking of matter, very properly uses the word *υπονοια*, *suspicion;* for our knowledge of matter is a *spurious* knowledge.

But how do these things accord with Aristotle and Plato, who are of opinion that matter is a certain subject to contrariety? Or may we not say that the assertions of others, concerning matter, tend in reality to an ultimate body: for there is not any thing opposed to body, and thus it will be unbegotten and incorruptible, not only body celestial, but also that which is sublunary. But the conception just now mentioned, preserves also the corporeal interval of sublunary natures, together with extended form; as, for instance, with that of man or horse. Or shall we say that when what is generated is essence, mutation also is produced about material vicissitude, which always remains; for accidents are changed about essences; but essences about the *quantum*, above-mentioned, of the Pythagoreans; either according to privation, or about the mutation from being, viz. about interval and material bulk: for air is generated from water, the qualities not only being changed, but also formal magnitude; since the magnitude on each side is different. Nor is the less a part of the greater, but each is a definite form, although material interval remains in both: for both are similarly material; and are similarly divisible, sensible, and without difference according to matter: for differences are surveyed according to forms. But that Aristotle had such a conception concerning matter, according to interval, and an indefinite quantum, is evident from what he says in the 4th book of this work: for he there says, "That by which place appears to be the interval of magnitude, by this it appears to be matter:" for this is different from magnitude; and this is comprehended by form, and is bounded, as it were, by superficies and end. But matter and the indefinite are of this kind. Those, however, who think fit to conceive of matter according to being, which is worse than forms, or according to the one which is the ultimate echo of the first one, do not in my opinion conceive rightly: for being, when it is surveyed as nothing else than one and being, is properly and primarily that which it is said to be. But matter is the last thing, and is a departure from being, and much more from the one, and subsists in a mutation and deviation from being; since, through the prolific power of being, it is necessary that a representation of being should have a subsistence.

From all that has been said it is evident, as Simplicius well observes, that privation is not a certain nature, according to Aristotle, but absence in the subject which is naturally adapted to receive form. Hence, when privation is said to be an accident to matter, it is not so said as if it were form, *but just as it happens* to any one not to be in the forum.

CHAPTER VII.

The next dogma of principal importance in the physiology of Aristotle, is that concerning nature, a word but little used in modern philosophy, and the accurate definition of which is at present utterly unknown. That the reader, therefore, may see, how admirably Aristotle has penetrated into the very essence of nature, and that he was deservedly called by the ancients *the dæmon of nature*, I shall cite what he says on this subject, and subjoin the excellent commentary of the most acute and accurate Simplicius.

Aristotle then begins the 2nd Book of his Physics as follows:

"Of beings, some subsist from nature[1], but others through other causes: from nature, indeed, animals subsist and their parts, together with plants and simple bodies, such as earth and fire, air and water: for,

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[1] Aristotle, says Simplicius in the preceding book, having discovered the first elementary principles of natural things, and having shown that generations are from contraries, the most common of which are form and privation; and having also demonstrated concerning matter, that it is the subject to contraries, that it is inherent in the composite, is unbegotten and incorruptible, and such other particulars as it belongs to a physiologist to assert of it; in the present book speaks concerning nature, since it was requisite that he should now discourse about the formal and producing cause: for, consequent to what had been said in the preceding book, it became necessary to speak concerning the elementary formal principle, and thus to pass on to the producing and final cause, since form subsists in the composite as an element, and is considered as a producing cause, both according to nature and definition.

In the second place, since some say that nature is form, and others that it is matter, and those speak more properly who assert that it is form, the speculation of nature is necessarily preassumed, in order to the distinction between form and matter. And in the third place, matter, since it is the subject both to things artificial and natural, possesses the same theory; but with respect to form, the artificial has every principle of motion externally, but the natural internally. Hence it is necessary that he who intends to speak about natural form, should, in the first place, distinguish things which have a natural from those which have not a natural subsistence. Besides, a discourse concerning nature is appropriate in this place: for in the first book he investigates all the common principles of mutation. Hence, he also considers the exemplars of artificial mutations, viz. that which is musical, and that which is void of music; but here, separating things which subsist by nature from things which have not a natural subsistence, he speaks concerning natural things, and omits such as are artificial. Hence, he necessarily speaks concerning nature, and things which subsist by and according to nature; first separating them from things which do not subsist by nature: for, at the end of the first book, he announces that he shall next speak concerning natural and corruptible forms. In short, a knowledge of nature, of that which subsists by, according to, and possesses nature, what each of these is, and in what they differ from each other, is necessary to him who discourses on Physics. But a knowledge of nature precedes all these. Hence, he first teaches us concerning it; not thinking it worth while to investigate if it is, because its subsistence is clear; but he demonstrates what nature is, and, together with this, demonstrates also that it is. And since both the mathematician and the physician are conversant with things which are governed by nature, the physiologist also shows the difference of these with respect to each other, in the meantime unfolding things pertaining to causes, viz. in how many ways they are predicated, and adducing instances according to each signification. Since, also, some assert that chance and fortune are causes, as those who say that any thing is produced from these; and others contend that good and evil are principles, asserting at for, we say that these, and things of this kind, subsist from nature. But all the things we have enumerated, appear to differ from those which do not consist from nature: for, all such things as subsist from nature, appear to contain in themselves a principle of motion and permanency[2]; some according to place, others according to increase and diminution; and others according to change in quality[3]. But a bed, a garment, and any thing else of this kind, so far as they obtain these appellations, and so far as they are produced by art, have no innate impulse of mutation. So far, however, as it happens to them to be stony or earthy, or mingled from these, so far they possess this impulse: nature being as it were a certain principle and cause of motion and rest, to that in which it is primarily inherent, essentially, and not according to accident. I say, not according to accident, because a man may be the cause of health to himself, in consequence of being a physician; at the same time, however, he possesses medicine, not so far as he is made well; but it happens that the same person is a physician, and acquires health. Hence, these are sometimes separated from each other. In a similar manner every thing else, which is made, subsists; for none of them contains in itself the principle of making; but some of them have this principle in other things, and external to themselves, as a house, and every thing else which is made by the hand; and others have it in themselves, indeed, yet not essentially;

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at the same time, that their separation into contraries is from fortune or chance; hence, also, he distinctly treats of fortune and chance, elegantly confuting the opinions of those prior to him, because though they considered these as causes, yet they said nothing about them. Simplicius also well observes that Aristotle employs, in this book, a clearer doctrine, since it is easier to understand him, here, both in the order of the problems, and in his diction.

[2] The word used by Aristotle here is ϛασις, which I have translated *permanency*, and not *rest*; for the proper word for rest is ηρεμια: and Simplicius observes that not every ϛασις is ηρεμια, but that only which is after motion. This word is employed also by Plato, in the Sophista, to express one of the five genera of being, viz. essence, *permanency*, (ϛασις) *motion*, *sameness*, *difference*, in which place it evidently does not signify *rest*.

[3] As water, when attenuated and heated.

viz. such things as are causes to themselves from accident[4]. Such, therefore, is nature. But those things possess nature, which contain, a principle

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[4] Aristotle, says Simplicius, properly calls *ορμην*, here, an internal principle of motion; but some, says he, write *αρχην*, *principle*, instead of *ορμην*: for natural things have the cause of motion in themselves, but artificial things externally; since they neither contain in themselves the artist, nor art: for a clod of earth is carried downwards, without being externally moved; but a bed derives its form externally. In like manner permanency to a clod of earth, when it has arrived at its wholeness, is internally derived; but permanency to the configuration of the bed, is derived externally from the artist. And both in things which subsist according to nature, and in those which subsist according to art, whence motion, thence permanency is derived; for of things which are naturally moved according to place, and also according to increase, and change in quality, some having arrived at their proper place, others at their proper magnitude, and others at their proper form, naturally stop. And neither are they changed to infinity, nor is the cause of their permanency external to them, but from themselves. A bed, however, a garment, and in short, artificial things, so far as they are artificial, possess the principle of motion and permanency externally; nevertheless, so far as a natural body is the subject to each of these, and is either wood, or wool, or some other simple or mixed body, so far these also contain in themselves the principle of motion and permanency. If, therefore, all natural things possess this in themselves, but things artificial, so far as artificial, do not, but, so far as they are natural, also possess these, this will be the peculiarity of natural things, so far as natural, to possess in themselves the principle of motion. Hence, it is evident that nature is nothing else than the principle of motion and permanency, in that in which it is primarily inherent, essentially, and not according to accident.

But the words, *in which it is primarily inherent*, *essentially*, *and not according to accident*, are added very necessarily: for a bed has the principle of motion and rest in itself, and when unsupported is carried downwards; yet so far as a bed, it is not called natural, nor is it said to possess nature; because the principle of motion does not belong to the bed, but to the wood, and through it to the bed also. The addition, therefore, of the word *primarily* is necessary; and that the words *essentially*, and *not according to accident*, are necessarily assumed, Aristotle himself insinuates; for it is necessary, if that which is natural is to be, that it should contain in itself, so far as it is, the principle of motion; for instance, for earth so far as earth, a tendency downward, is to have a nature. Nevertheless, if a physician, being diseased, should heal himself, he would be healed from himself, for he would possess in himself the principle of motion, yet not essentially but from accident: for a physician is not healed from himself so far as he is a physician, but so far as he is diseased; since he heals, indeed, so far as he is a physician, but is healed so far as he is diseased. And it is one thing to be a physician, and another to be diseased; hence, also, they are separated from each other; for neither is every physician diseased, nor is every one who is diseased a physician. So that the physician who is healed from himself, does not heal himself so far as he is diseased, but so far as he is a physician; and according to this, he has from principle of this kind. And all these are essences or substances; for nature is always a certain subject, and is in a subject. These things, too, are said to subsist according to nature, and such as are essentially inherent in these. Thus, for instance, fire tends upwards, according to

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from himself the principle of motion: for if he had this principle, so far as he is diseased, every one who is diseased would heal himself; since he is healed, so far as he is diseased. But he possesses the principle of motion, and of being healed, from himself, not so far as he is diseased. But Aristotle beautifully renders the term, *according to accident*, manifest, by saying, "Hence they are sometimes separated from each other." For that which is essentially inherent in any thing is inseparable from that thing; but that which may be separated is not essentially, but accidently inherent.

But the term *primarily* differs from the term *essentially*: for not every thing which is *essentially* is *primarily*, nor every thing which is *primarily* is *essentially*: for when one thing is essentially inherent in another, and that again in some other third thing, then the first is essentially inherent in the third, but not primarily. Thus, for instance, the equality of three angles to two right, is essentially inherent in a triangle, so far as it is a triangle. Triangle also is essentially inherent in the isosceles: and, hence, the possession of three angles equal to two right is essentially inherent in the isosceles; for so far as it is isosceles, it is a triangle; and so far as it is a triangle, it has angles equal to two right. The being a triangle also, and the possession of angles equal to two right, are inseparable from the isosceles; yet the having angles equal to two right, is not *primarily* in the isosceles, but is through triangle as a medium. Again, whiteness is primarily inherent in superficies, and virtue in the soul; for it is not through any other medium. These, however, are not inherent essentially; for they do not give completion to the essence of their subjects, nor are they assumed in the definition of them. Whitness, too, may be separated from superficies, and virtue from the soul. But sometimes both these concur in the same thing, when they give completion to essence, and are inherent without a medium. Thus reason may be said to be inherent in man *essentially* and *primarily*: and the possession of angles equal to two right, in a triangle; and a triangle in isosceles. But if a ship has in itself that which moves it, viz. the pilot, yet it does not possess this essentially; for neither does the pilot give completion to its nature; since, if he did, every ship, immediately on being a ship, would not be in want of that which moves it externally, nor would the pilot be separate from it: since nothing which is essentially inherent in any thing, can, while that thing is preserved, be separated from it. And though the pilot in moving the ship moves himself, yet he does not move himself either essentially or primarily.

Simplicius adds, the great Syrianus observes that the definition of nature here given is nearly adapted to all the significations of nature, when appropriately assumed in each; for, as the word nature is homonymously predicated of matter and form, and of that which is as it were a germination; thus also the present definition must be directly understood of that which is properly called nature, but according to analogy, of other principles; for other natures are also principles of motion, but not after the same manner.

nature; for this property is not nature, nor does it possess nature, but is by nature, and according to nature. What nature, therefore, is, has been said, and also what a subsistence is, by and according to nature[5].

But to attempt to demonstrate that nature is, would be ridiculous; for it is evident that there are many beings of this kind; and to demonstrate things apparent through such as are unapparent, is the province of one who is incapable of judging what is essentially, and what is not essentially known. That some, however, may be thus affected, is not immanifest: for one who was blind from his birth may reason about colours[6]. So that men of this kind must necessarily discourse about names, but understand nothing of the subject of their discourse. But to some, nature, and the essence of things which subsist from nature, appear to be that which is first inherent in every thing, and which is essentially destitute of order and ornament. Thus, for instance, wood is the nature of a bed, and brass of a statue; of which, according to Antiphon, this is a token, that if some one should bury a bed, and the rottenness should receive a germinating power, a bed would not be generated, but wood; as if the disposition which is according to rythm[7] and art, were inherent from accident, but the essence that which remains, and which to these things is continually passive. If also each of these is affected after the very same manner towards something else—as, for instance, brass and gold towards water, but bones and wood towards earth, and in like manner any thing else—these things, he says, are their nature and essence. Hence, by some, earth—by others, fire—by others, air—and by others, water—is said to be the nature of things. And by others this is asserted of some, and by others again of all these. For that which some one of these apprehends to be a thing of a certain quality, whether it be one or many, this and so many, they say, is every essence: for all other things are the passions, habits, and dispositions of these. They also asserted that any one of these, whatever, is perpetual, because no change is produced in them from themselves; but that other things are infinitely generated and corrupted. According to one mode, therefore, nature is thus denominated, viz. the first subject matter to every thing which contains in itself the principle of motion and mutation. But after another mode it is denominated form, which subsists according to definition: for as art is called that which subsists according to art, and that which is artificial; so likewise nature is both called that which is according to nature, and that which is natural. Nor must we say that any thing, for instance, a bed, possesses a subsistence according to art; if it is a bed only in capacity, and has not yet the form of a bed; nor must we say that it is art. Neither in things which consist from nature must this be asserted; for that which is flesh or bone in capacity, does not yet possess its proper nature until it receives its form according to definition; by defining which, we say what flesh is, or bone. Nor does it subsist *by nature:* so that the nature of things which contain in themselves a principle of motion, will be after another manner morphe and form, which are not separate, except according to definition[8]. But that which is composed from

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[5] Every thing which possesses nature is essence or substance, because it possesses a certain subject, and is in a subject, or, in other words, it is matter and form, which are properly sensible essence. But a subsistence according to nature is more extended than the possession of nature; for things which possess nature are said to be according to nature, as being characterized according to the nature which is in them, and being that which they are said to be. Not only, however, these things are said to be according to nature, but such also as are essentially inherent in these; for fire possesses nature in itself, having a principle and cause of motion upwards. But a tendency upwards is according to nature, and by nature to fire, which tendency upwards is no longer the possession of nature, nor is this nature: for, neither is it essence, but power and energy, subsisting in fire according to the reason of nature, and is thus said to be according to nature. The same also is said to be by nature: for, through its own nature, and being thus naturally adapted, it possesses such a power and energy. And to fire, indeed, a tendency upwards is both by nature and according to nature: yet *by* is not the same as *according to nature*, but the former is more extended than the latter; for we say that things *according to* are *by nature*, possessing their proper perfection. But there are some things *by nature*, as things which are produced according to the energy of nature, and yet are not *according to nature*, such as mutilation from birth, and, in short, things which consist in privation: for these are such from natural adaptation; because privation is absence in that which is naturally adapted to receive. And a subsistence *by nature* may be asserted of every thing which is consequent and happens to a natural essence, so far as it is such; as to be coloured and to be diseased happen to body. But a subsistence *according to nature*, is alone asserted of that which happens according to the will of nature. Hence we say that to be well is *according to nature*, but that to be diseased is present *by nature*, being contrary to nature. When, therefore, Aristotle uses the term *by* and *according to* nature, he does not say that these are the same, but that a tendency upwards is *by* and *according to nature*, to fire.

[6] From what he has heard about colours.

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[7] It appears from Simplicius, that in the more early editions of the Physics, *νομος*, *law*, was written instead of *ρυθμος*, *rythm*. He also observes that *μορφη*, *form*, is called *rythm*.

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[8] Aristotle having completed and dismissed the hypothesis which asserts that nature is the subject of things, passes on to that hypothesis which says that form is nature. But since nature communicates with art according to formal power, and differs from it so far as nature makes form according to the matter of art, of the bed according to wood, and of the statue according to brass, hence some, conceiving that matter is nature, argue from this difference, asserting that a bed, if it were buried in the ground, would appear to be nature according to the wood, and not according to the outward form. But others, who assert that form is nature, argue from the formal communion between nature and art: for, say they, as in things which are produced according to art, that which is so produced, and the artificial, are called art; for we say that the outward form of the statue is a wonderful art; thus also in things which subsist by and through nature, that which is according to nature, and is natural, will be nature. For we say, for instance, that the nature of the wood is admirable, according to its form; for as is art to that which is according to art, so is nature to that which is according to nature; and alternately, as geometricians say; since art is in that which is according to art, and nature in that which is according to nature. But in things which are according to art, they are not yet said to be according to art, until they have received form; but prior to this, they are only in capacity according to art. Hence, neither is art in them, for art is in form: since the brass is not the art of the statue, but the form. Neither, therefore, in things which are produced by nature, is that which is only now in capacity, according to nature; nor does it possess nature: for neither flesh in capacity, nor bone in capacity, possesses the nature of flesh or bone, before it receives form. If therefore a thing, in receiving form, possesses nature, form will be nature. And you may syllogize as follows: That by whose presence things which are *by nature*, are *by nature*, *that* is nature. But things which are by nature are so through the presence of form. Form, therefore, is nature. But since form is twofold, the one according to *morphe*, but the other according to *reason*, through which we define what every thing is, according to morphe alone we assign the figure, colour, and magnitude of superficies; but through the form, which subsists according to reason (ειδος) we assign a subsistence according to the uniform type of an evolved definition; which also, as well as the name, concurs with the definition. This also comprehends morphe.

Aristotle, therefore, says that this form, which subsists according to reason, or that a morphe of such a kind, is nature. Hence he adds morphe to form, saying, "after another manner *morphe* and *form*:" and again, "*morphe* and *form*, which are not separate." In art also morphe and from these is not nature, but consists from nature: as, for instance, man. And this is nature in a greater degree than matter: for every thing is then said to be, when it is form in energy, (εντελεχεια)[9] *entelecheia*, rather than when it is in capacity.

Farther still: man is generated from man, but a bed is not generated from a bed. Hence they say that not the figure but the wood is nature; because if it should germinate, it would not become a bed, but wood. If, therefore, this is art, form also is nature; for a man is generated from man. Again: nature considered as generation, is a path to nature: for it does not subsist in the same manner as healing, which is said to be a path not to medicine but to health; since it is necessary that healing should be procured from medicine, and not lead to medicine. Nature, however, does not thus subsist with respect to nature; but that which is born proceeds or takes its beginning from something to something. To what, then, does it proceed? Not to that from which, but to that to which. Form, therefore, is nature [1]. But form

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and form are the same, after another manner, because the reason or definition of the artist is according to morphe. And this also shows that nature is form: for if the nature of every thing consists in its being, and the being of every thing is in form, according to reason and definition; hence definitions being converted with the things defined, nature will be form. So that, according to the former arguments, matter will be nature to natural things; but according to what is now said, this must be asserted of form, which is inseparable from its subject, and is alone capable of being separated from it by definition. Simplicius adds, that those things are said to be *separate*, which, being separated from the things from which they are said to be separated, still retain their own nature. But such as, when separated, are corrupted, are not *separate*. And such is the form which is in matter: for being to natural things is according to this, and not according to separate form.

[9] Simplicius informs us that the word *entelecheia* is said to be peculiar to Aristotle, and that it signifies form which is being in energy, so far as, according to this, it is an assumption of one end, or that it is an assumption of one perfect essence, or is a continuity of the perfect, i. e. a habit according to the perfect.

[1] Aristotle adduces this third very appropriate argument by which it may be shown that nature is form: for nature, which is so called as a germination and generation is a way proceeding to the nature of that which is produced, and ending in it. As, therefore, in things artificial, every thing which is produced, is said to be produced that thing to which the progression tends, and not that from

form and nature are predicated in a twofold respect; for, privation also, is in a certain respect form. Whether, however, privation and something contrary, do or do not subsist about simple generation, will be considered hereafter."

Since this appears to be the end of what is said by Aristotle concerning nature, let us with Simplicius recapitulate the account that has been given of it, and investigate what nature is according to Aristotle, and what power it possesses among beings: for he very properly makes the discovery of it to arise from the difference between things which subsist by, and those which do not subsist by nature. Thus also Plato, in the Phædrus, discovers what soul is, from the difference between things animate and inanimate: "For every body, says he, which derives its motion externally, is inanimate, but that which possesses motion internally from itself, is animated, as if this were the very nature of soul." And in the Laws, "we assert, says he, that what is moved inwardly lives, and by this, that which is animated differs from that which is inanimate." Aristotle also, in his second book 'On the Soul,' says nearly the same thing in the same words: for, he says, "Beginning our speculation, we assert that what is animated differs from the inanimate by life."

But things which do not subsist by nature are twofold: for some of them are above nature, as things immaterial, incorporeal, separate from bodies, and established in pure forms. But others are worse than natural things, such as are the productions of human art; as, for instance, a bed, a garment, and such like material bodies. It is common, however, both to things which are above, and to things which are posterior

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from which it proceeds; for, when a carpenter makes a chair from wood, the wood is not said to be generated, but the chair, by the carpenter. In like manner also in natural things: for when water is changed into air, we do not say that water is generated, but air. So, likewise, with respect to that which germinates when it has arrived at its nature, it is said to have germinated, but it is not said that it has proceeded from nature. But it arrives at form. Form, therefore, is nature. The reasoning, therefore, is as follows: Nature is that to which that which germinates and is generating, or becoming to be, tends. But a thing of this kind tends to form, and not to matter. Nature, therefore, is form.

to nature, to be immoveable and immutable from themselves; though to the latter according to a worse, and to the former according to a more excellent mode of subsistence. Natural things, therefore, being in the middle of both, through falling below every immaterial and incorporeal essence, are material and corporeal; but, through not being produced by human art, but springing up and blossoming as it were from themselves, the demiurgic cause of them being unapparent to sense, they are called natural. But, through the difference with respect to both these, they are said to possess the principle of motion and mutation in themselves. Very properly, therefore, does Aristotle assert this to be the character of nature and its essence, viz. that it is the principle of motion and mutation, and of rest, which is the boundary of this mutation.

But soul also is the principle of motion and mutation to animated bodies, both according to Plato and Aristotle. What, then, is the difference? The last soul, indeed, which is called the vegetable soul, is, according to Aristotle, different from nature, though this vegetable soul is frequently called nature, from being proximate to it. But every soul, and even the last, is called by Aristotle, in his books 'On the Soul,' the entelecheia of a *natural* organic body. The vegetable soul, therefore, will be inherent in a body which possesses nature, and will consequently be different from nature. Not only organic bodies, however, possess nature, but those also which consist of similar parts, and the four elements. Again, we call those beings animated, which contain in themselves the cause of being nourished and increased, and of generating things similar to themselves. But things which are not of this kind are still natural, such as stones and metals, dead bodies, and simple bodies. Farther still: every body has nature: for the subject matter of things artificial is natural, such as the brass of a statue, the wood of a bed. But not every body is animated, so that nature will not be soul. It is also evident that nature is inferior to the vegetable soul, since such a soul accedes to a natural body in the same manner as form does to matter. How, therefore, does Aristotle unfold the difference between nature and soul? To this it may be replied, that the term *in which*, is sufficient for this purpose; and afterwards he more clearly says that nature is in a subject: for every soul, since it properly possesses a motive power, is exempt from that which is moved. But if this should not be sufficient for those who think that the vegetable and irrational soul, is in body as in a subject, yet this consideration, that soul is the *most proper* principle of motion, is sufficient to the understanding what a *natural* subsistence is, and for the purpose of distinguishing nature from soul: for Aristotle does not say that nature is the principle of motion, in the same manner that Plato says soul is. Soul, indeed, is motive of bodies according to both these philosophers; but nature is a principle of motion, not according to *moving*, but according to the *being moved;* and of rest, not according to *imparting*, but *receiving* rest. Hence, natural things are not said to be moved by themselves; for they would be able, as Aristotle says, to stop themselves, if they were also able to move themselves. But *nature appears to be a certain aptitude to the being moved and adorned, germinating upwards, as it were, from beneath, and by its excellent habitude calling forth adorning causes:* for if it were the principle of motion, as moving something, according to this, it would not differ from soul, which is a primarily moving cause. But since bodies are far distant from an impartible and unextended essence, and, according to the being of life which was once inherent in them, they become dead bodies, of themselves destitute of breath, and deprived of all life, they possess in themselves a certain ultimate form of life, according to that capacity and aptitude which we call nature; through which also dead bodies are capable of being moved and changed, of vegetating, and in a certain respect passively energizing on each other: for the energies of these are not genuine, but passive. Hence, all natural things move in consequence of being moved, though as Aristotle says, that which is properly immoveable, moves. But that Aristotle defines nature to be a principle of motion, not of moving other things, but of being moved, is evident from his saying that nature is a certain principle of being moved, and of rest, and that nature is in a subject: for that which is in a subject, will not be a principle properly motive of its subject. In the last book, too, of this treatise, speaking of the four elements, he says, "That no one of these moves itself is evident, but it possesses a principle of motion, not of making nor moving, but of being moved." Hence, he investigates by what the elements are moved, as not being moved by themselves: for he is of opinion that this is the peculiarity of animals possessing a soul, which he defines to be a motive principle. And prior to this he says, "After the same manner, that is moveable by nature, which is in capacity quale or quantum, or where, when it has such a principle in itself;" certainly meaning by such a principle, nature. But in his second book 'On the Heaven,' he thus writes: "In no one of things inanimate do we see whence the principle of motion is derived: for some things are not moved at all: but other things are moved, indeed, but not every way similarly. Thus fire is alone moved upwards, and earth to the middle." If, then, the four elements are natural, and have not in themselves that whence the principle of motion is derived, i. e. the moving cause, certainly motive nature is not in this manner said to be the principle of motion, but as the principle of being moved. But if nature is a thing of such a kind, as to subsist in capacity, and to be an aptitude to be moved, how do we frequently say that nature is effective? Aristotle also, in this book, says that nature is analogous to art; and near the end of it shows that nature produces for the sake of the end. And, concluding his reasoning, he says, "That nature, therefore, is such a cause as to subsist for the sake of (the end) is evident." But in the first book 'Concerning the Heaven," clearly conjoining the fabrication of nature to divine fabrication, he says "that God and nature make nothing in vain." In answer to this it may be said, that every thing which is generated, is generated from a certain subject, which is in capacity, that which it is about to become, through the producing power of an efficient in energy. Both these also are necessary to the effect. Hence, nature, though it is the aptitude of a subject, is said to make, as contributing to the effect. When Aristotle likewise says that nature makes for the sake of something, he says this in consequence of the generation of natural things looking to a definite end, and not subsisting from fortune or chance, but as being naturally adapted to be generated, as they are generated. In this book, therefore, he says that in those things in which there is a certain end, one of them is performed for the sake of the end, &c. As it is performed, therefore, so is it naturally adapted to be performed. And as every thing is naturally adapted, so is it performed, unless there is some impediment. Is it not evident, therefore, that Aristotle calls this adaptation, that which is natural? Though he says, therefore, that God and nature make nothing in vain, he says this in consequence of nature from beneath, imparting aptitude, looking, in so doing, to a beneficent end, but divinity from on high, illuminating a thing of this kind in energy. Aristotle, then, after this manner discovered the subsistence of nature, from the difference between things which are *by*, and those which are *not by* nature. But those more ancient than Aristotle, appear indeed to have had such a conception as this of nature, as being surveyed according to the aptitude of every thing to motion, through which natural things are characterized. Since, however, all natural things have matter and form, some of the ancients gave a power of this kind to matter, calling nature that according to which natural things are adapted to be moved, perceiving at the same time, that they are especially changed according to matter, as a bed according to the wood from which it is composed. But others called nature that according to which natural things have their being; and since form is the character of every thing, according to which every thing subsists, and is said to be what it is, on this account they said that nature is form; for through this conception of nature, viz. that it is *the character of every thing*, we employ the name of it in all things, and do not refuse to say, the *nature* of soul, of intellect, and even of divinity itself.

Aristotle, however, neither thinks fit to call matter by itself, nature, because matter is of itself an inefficacious subject; nor does he think fit to call it form, for this is *natural*, and not *nature*. But he calls nature *the aptitude of matter to its appropriate motion and mutation, when it changes from this form into that*: for the rejection and resumption of form by matter is effected according to physical aptitude. Form, also, according to its own nature, is both generated from its opposite privation, and when generated is preserved. It is likewise moved, being at the same time both a patient and agent, or rather, passively energizing. Hence, matter and form are, indeed, natural things, but neither of them is nature. In like manner, neither is the composite from matter and form nature. But form is more entitled to the appellation of nature, than matter, through its character and power. The composite, also, is more allied to nature than matter, through form; since, in short, a natural thing then becomes this or that, when it receives form: for matter is of itself indefinite. But nature, being an aptitude to the subsistence of form, very properly in a certain respect subsists prior to form, since it is in capacity in matter. It likewise previously exhibits in itself form, of which it is the nature, *being as it were a production and regermination from matter*. Hence, those speak well who say that *nature is the last life*: for as the effervescence as it were of the first being into the separation of formal subsistence, and the departure from being to energy, is the first power and the first life[1], subsisting according to the first motion of being, so the germination of material form from matter, and its motion to it, when considered according to the existence of form in capacity, is the last power and the last life. Hence, in the intelligible world being is above life; and in the sensible world, matter is posterior to nature, because more elevated causes pervade farther than such as are subordinate. But nature being the life of form, is not only a germination from it, but the coherence and rising tendency of that which is generated, to do and suffer that which it is naturally adapted to do and suffer.

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[1] The intelligible triad, or the first procession from the ineffable principle of things, consists of *being*, *life*, and *intellect*; or, in the language of the Chaldæan theologists, of *father*, *power*, and intellect. See my Introduction to, and Notes on, the Parmenides of Plato.

CHAPTER VIII.

LET us in the next place consider what Aristotle says concerning *causes*, though his enumeration and definition of them are at present obsolete, in consequence of the attention of modern philosophy being solely directed to *effects*, and confined to the inextricable labyrinths of matter.

In the Third Chapter, therefore, of the Second Book of his Physics, he observes respecting causes as follows: " Cause is after one manner said to be that, from which, being inherent, something is produced: as for instance, brass is the cause of the statue, silver of the bowl, and the genera [3] of these. But after another manner cause is form and paradigm, (and this is the definition of the essence of a thing) and the genera of this. Thus for instance, the form of the diapason is two to one, and in short number, and the parts which are contained in the definition. Farther still, cause is that whence the first principle of mutation or rest is derived. Thus he who consults is a cause of this kind, and a father of his child, and in short, the maker of that which is made, and that which changes of that which is changed. Again, cause is as the end; and this is that for the sake of which; as health [is the final cause] of walking. For why does a man walk? We say, that he may be in health; and having thus said, we think that we have assigned the cause. This cause also is seen in such things as are for the sake of the end, when something else moves which has an intermediate subsistence. Thus leanness, or purgation, or medicines, or instruments, are for the sake of health; for all these are for the sake of the end. They differ, however, from each other, because some of them are works, and others instruments. Causes, therefore, are *nearly* [4] predicated in so many ways."

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[3] Not only the proximate matter is the cause of that which is generated, but also the genera of this matter: for not only the brass is the cause of the statue, and the silver of the bowl, but brass *simply*, and silver *simply*. And if these metals were originally water, as all metals were, both according to Aristotle and Plato, water is the cause of these, and above this body.

That there are however, so many modes of causes, as are here enumerated by Aristotle, and neither more nor less, we may, with Simplicius, syllogistically collect from division, previous to which thus much must be observed, that those are causes through which being is such as it is, and that which is generated, and through which when interrogated, we assign *the why*. Natural things, therefore, being composites from matter and form, are that which they are, and are generated that which they are generated, either through the things which give completion to them, or through externals, in whatever manner they may communicate with them. But matter and form give completion to them; and on this account they are material and natural. If also it is inquired why sensibles are endued with interval, intelligibles being without interval, we reply, it is because sensibles are material. But why do the heavens possess such a facility of motion? Because being spherical, they proceed, according to Plato, on the smallest foot. And these are assignations of causes from matter, and from form, to all which, things that in an elementary manner give completion to the composite are referred. But since all natural things are generated, according to Aristotle, and every thing generated has a cause of its generation, it is necessary that there should be a cause that makes and fabricates generated natures, and from whence the first principle of motion is derived: for the principle of motion is twofold, the one being self-motive, the other immoveable: for that which is alter-motive, will evidently not be the principle of motion, but the self-motive nature will be the principle of motion, as possessing in itself that which is motive. This, however, is not properly the principle, because it is itself also moved. But the principle of motion, properly so called, is that which moves only, and not that which is also moved. So that the most proper producing cause of generated natures will be that which is immoveable, eternal, and which always subsists according to the same and after a similar manner. But much-honoured intellect is a thing of this kind, and next to it, soul: for though she is moved, yet she contains that which moves or is motive in herself. Hence Aristotle thinks fit to call her rather immoveable, considering those things as alone moved which are corporeally changed. But since those natural things that are generated and corrupted are proximately produced by circulating and perpetual bodies, for man and the sun generate man, that which properly makes will not make by an immediate proximity to things generated and corrupted, but through perpetual natures as media. And thus the instrumental cause becomes manifest to us, which is indeed moved by another, but moves something else, and is clearly seen in artificial production. For an axe is a concause, because it moves being moved. Such also is nature, both whole and partial, as Alexander Aphrodisiensis likewise acknowledges, well observing, that a producing cause properly so called, ought to be separate and exempt.

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[4] Aristotle, says Simplicius, adds the word *nearly*, either because causes *properly* so called, are predicated in so many ways, since there are also many causes *according to accident*, as he says; or he adds this word through reverence of Plato, who connumerates the paradigmatic cause with proper causes, viz. with the final and the producing, but the instrumental cause with concauses, viz. the material and the formal. But if there is so great an order in causes, that some of them are first by nature, i. e. the efficient and the final, and are causes properly so called, but others are rather concauses, such as matter and form, causes are very properly said to rank among things which are multifariously predicated, but not among things which are distributed as from one genus.

Again, since natural and generated form is a participation of form in matter, but all participation is a resemblance of that which is participated, it is entirely necessary that there should be a paradigmatic cause of material natures. But that which makes, either makes rashly and by chance, or has some purpose in view, and establishes an end of its production, for the sake of which the maker makes, and that which is generated, is generated. But if that which makes primarily and properly makes rashly and by chance, what will there be among makers which will make for the sake of good? It is necessary, therefore, that the first maker should make for the sake of something, and should have for his end that for the sake of which he makes. And thus also the final cause will become apparent to us from the first maker, who is established as the object of desire to the other producing causes. And that these, indeed, are the causes of generated natures, is evident. But that there are only these, may be seen from division: for that which is generated, which we call natural and a composite, is a certain subject, is in a subject, and is nothing else. It is likewise either self-subsistent, or derives its being from some other. If, therefore, it is self-subsistent, it is impossible that it should be generated in a part of time, and that it should be corporeal and divisible. Hence, it must have some other producing cause beside itself; and this must either be moved, or immoveable. And if moved, it must either be moved by itself, or by another. But that which is moved by another does not primarily move. And that which is moved by itself, either in one part moves, and in another is moved, or it moves and is moved according to the whole of itself, as is the soul, according to Plato. But this is the principle of motion and generation. It does not, however, impart the never-failing, so far as it is moved, nor is it perfectly the primary leader of motion, so far as it has a certain duplicity of that which moves and that which is moved. The immoveable, therefore, is the first principle of motion, subsisting as a *properly* producing principle, and as eternally motive. But that which at some particular time is generated and moved, cannot proximately be generated and moved by an eternal and immoveable principle: for sucha princi ple is productive, and motive of things eternal. But that which is eternally moved by it, according to the different conditions of itself, is the cause, as an instrument, of things which are generated and moved at some particular time, because it moves being moved. And if every material form is either the first, or from the first, and with reference to the first, but nothing material is the first, being a participation,—there is something first to which it is assimilated. And if that which properly makes, either makes rashly and casually, or looking to a definite scope, and if it is impossible it should make casually, it is necessary that there should always be a certain end, and that for the sake of which a thing energizes or subsists.

CHAPTER IX.

Aristotle having asserted that nature is a producing cause, and defined it to be a principle of motion, it becomes requisite in the next place to direct our attention to what he says concerning motion, both as this forms one of the most important of his dogmas, and his discussion of it is replete with the most consummate accuracy, profundity and subtilty of conception. For if nature has its essence in being the principle of motion, it is perfectly necessary that he who intends to know what nature is, should also know motion which is assumed in the definition of nature. To which we may add, that if the knowledge of relatives is simultaneous, but principle and that of which it is the principle are relatives, and if nature is a principle of motion, it is impossible that he should have a knowledge of nature who is ignorant of motion.

Motion, therefore, according to Aristotle is a flux or tendency to form. This will be evident from considering that for any thing to be moved is nothing else than to tend and accede successively to form, which acceding is by nature prior to form, just as a passage or way is conceived prior to the boundary to which it leads. And here it deserves to be noted that this tendency to form is the acquisition itself of form; and this acquisition of form is in *reality* the same with the form that is acquired. Hence, motion is excellently defined by Aristotle to be *the energy of that which is in capacity so far as it is in capacity;* where by *energy* must be understood the tendency to form which is the perfection of the moveable thing, or of that which is in capacity. Thus, for instance, the acquisition of heat is motion, because it is the energy of the water which becomes hot, and which is in capacity to some new degree of heat, so far as it continually proceeds to it. In this definition, therefore, *energy* is in the place of genus, which particle excludes whatever is in no respect energy. But the words *of that which is in capacity*, remove all momentary mutations, in which the whole perfection of form is at once obtained, and besides this they remove all perfect, or perfectly acquired energies which leave no capacity in the subject matter to any farther acquisition. Again, the words, *so far as it is in capacity*, exclude imperfect, or imperfectly acquired energies, when all motion has ceased, as in the water which now ceases to become any longer hot. They also exclude corruptive motions; since Aristotle by the words *in capacity* understands a capacity for the acquisition of energy and perfection. From this definition also it is sufficiently evident, that all motion properly so called is at the same time both successive and continued, so that other mutations are improperly denominated motions.

This being premised, I shall present the reader with what Aristotle says on this subject, and subjoin the excellent commentary of Simplicius on his words. Aristotle, therefore, begins the Third Book of his Physics as follows:

" Since, however, nature is a principle of motion and mutation, and the method with us is concerning nature, it is necessary that we should not be ignorant what motion is: for this being unknown, nature also must necessarily be unknown. And as we intend to define motion, we must also endeavour, after the same manner, to discuss those things which are consequent to this. But motion appears to belong to things continuous; and the infinite first presents itself to the view in that which is continuous. Hence, it frequently happens that those who define the continuous, employ the nature of the infinite, as if that which is divisible to infinity is continuous. To which we may add, that it is impossible for motion to subsist without place, and void, and time. It is evident, therefore, that for these reasons, and because these things are common and universal to all things, we should in the first place make each of these the object of consideration; for the speculation of *peculiarities* is posterior to that of things *common*. But first, as we have said, we must direct our attention to motion. There is then something which is in energy only; and there is something which is both in energy and capacity[5]. One thing also is this particular thing; another so much in quantity; and another of a certain quality; and, in like manner, in the other categories of being. But of relatives, one is predicated according to excess and defect: another according to the effective and passive, and, in short, the motive, and that which may be moved: for the motive is motive of that which may be moved; and that which may be moved, may be moved by that which is motive. Motion, however, has not a subsistence[6] separate from things: for that which is changed is always changed, either according to essence, or according to quantity, or according to quality, or according to place.

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[5] Being which is in energy alone, is, as Simplicius well observes, in the essences of things unbegotten, and their essential energies; but that which is both in capacity and energy, according to all the predicaments, is in generated natures. And again, things simply in energy alone, are immaterial and first forms: for these cannot become any thing else than what they were from the beginning. But things which subsist both in capacity and energy are the composites from matter and form; for these are in energy, indeed, so far as they have now a certain form and disposition in energy, as, for instance, brass; but they are in capacity, because they are capable of receiving another form, as brass that of a statue. But an etherial body is essentially in energy alone; for it will never be changed according to essence. It participates, however, in a certain respect of a subsistence in capacity, through local motion, and the participations differing from each other which are produced by it: for such a body is not every where at once, nor is the mixture of all things in it, always similar, as is evinced by the effects of different celestial figurations being different.

Simplicius further observes, that Aristotle does not divide being as a genus into a subsistence in energy, and a subsistence in capacity and energy, but as an anonymous word. And that a subsistence in capacity is one thing, and capacity another. Likewise that a subsistence in energy is opposed to a subsistence in capacity, and energy to capacity. He adds, and *capacity, indeed, is a perfect preparation of essence, and an unimpeded promptitude to energize, prolific of energy.* But a subsistence in capacity is an aptitude imperfect with respect to that which is said to be in capacity, receiving a subsistence in energy from another, and not deriving it from itself. But that is in energy which is now able to energize according to that which it is said to be; for a man is in energy, who now energizes according to the human form. But energy is opposed to power, and also energetic motion proceeding from power. The appellation, likewise, of a subsistence in capacity, is derived from capacity remaining within, unapparent, being surveyed in aptitude of essence alone, and being as it were the disposition of essence. But from energy the appellation of a subsistence in energy is derived, according to essence again surveyed as cooperating.

[6] Since, says Simplicius, the philosopher from Lycia (i. e. Proclus) asserts that this one dogma alone, concerning motion, of Plato and Aristotle is discordant, since the latter asserts that motion

motion is not separate from things, and subverts its subsistence as a genus, but the former says that motion is one of the genera of being, in the same manner as essence, sameness, and difference, it will be better to evince, if possible, the concord in this apparent dissonance. It may, therefore, be readily said, that Plato surveying what he calls the genera of being, in the intellectual order, as the first separate causes of beings, very properly unfolds motion and permanency, and the other genera, as subsisting in themselves. For as union is ineffable in them, so likewise is their purity unconfused. But Aristotle inquiring concerning natural and material motion, very properly surveys a motion of this kind in things that are moved: for motion in these does not subsist by itself. Hence, he also adds, "For that which is changed, is changed either according to essence, or according to quantity, or according to quality, or according to place." But that mutations and the categories properly subsist in generated natures is manifest to those who have diligently considered them.

It may, however, be said in a way still more proximate and apposite to our purpose, that Aristotle surveyed the peculiarity of motion in a very admirable and profound manner. For considering it as subsisting in energy and passion, he very properly says that motion is not separate from things, that is, is not separate from the genera of being. Hence he adds, "that which is changed, is always changed either according to essence, or according to quantity, &c." For how is it possible to survey energy or passion by themselves, separate from that which energizes or suffers? Plato also knew a difference of this kind in beings, according to which some things have an essential subsistence, but others are beheld with, and in others. But, in the third place, it may be said that the thing proposed by Aristotle is to show that motion is not a genus, as neither did he conceive being to be a genus, because it is not similarly adapted to all beings, which also the friends of Plato acknowledge, since they likewise assert that being pervades to beings analogously, in the same manner as Aristotle. Hence this signification of genus is one thing, viz. which is divided into species equally participating of genus, which Aristotle denies of motion, because there are many motions, and which differ from each other in the degree of motion; but that signification of genus is another thing, according to which Plato denominates the genera of being which pervade through all things, though not equally, nor do they subsist in all following natures, according to the same peculiarity. It is not, therefore, at all wonderful, if Plato calls motion a genus, according to this signification of genus, but Aristotle denies it to be a genus, according to the other signification of the word; especially since genera with him do not subsist by themselves, neither are they separate from species, nor are species separate from individuals, since he surveys species and genera as the elements of individuals, and not as exempt causes. In the fourth place, those who philosophise should observe, that the motion is of one kind, which Plato considers as a genus of being, surveying it according to a different signification, and that the motion is of another kind, and has a different conception, about which Aristotle now instructs us: for that motion which Plato celebrates, signifies the first departure from being into place. But in these, as we have said, nothing common can be assumed which is neither this particular thing, nor a participant of quantity or quality, nor of any one of the other categories. Hence, there will not be either motion or mutation of any thing except the particulars we have mentioned. But each of the categories subsists in a twofold manner in all things. Thus with respect to this particular thing, one thing pertaining to it is form, and another privation. In quality, one thing is white, and another black. And in quantity, one thing is perfect, and another imperfect. In like manner also in lation, one thing is above, and another beneath; or one thing is light, and another heavy. So that the species of motion and mutation are as many as those of being. But since in every genus of things, there is that which is in entelecheia, and that which is in capacity; motion is the entelecheia of that which is in capacity, so far as it is in capacity. Thus change according to quality is the energy of that which may be so changed, so far as it is capable of this change: and increase and diminution are the energies of that which may be increased, and of its opposite, that which may be diminished; for there is no name common to both. Generation and corruption, also, are the energies of that which may be generated, and of that which may be corrupted: and lation is the energy of that which may be locally moved. But that this is motion is hence evident: for when that which may be built so far as we say it is such, is in energy, it is then built, and this is building. In like manner with respect to discipline, healing, rolling, and leaping,

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into vital and intellectual powers and energies, and is perfectly immutable, as is evident from what he says in the Sophista, from which motion appears to be discovered. Since, however, all things, as we have before observed, are there with unconfused union, and possess separation without divulsion, and are self-perfect, on this account Plato surveyed there, motion subsisting by itself, and considered it as a genus of being. But the motion which is here investigated by Aristotle, is a mutation ever flowing, and the energy of that which is in capacity, while it remains in capacity. Hence it is measured by time, just as the former motion is measured by eternity, and flourishes in things that are moved, not having a subsistence by itself. Simplicius adds, that the cause of this difference of conception appears to him to be this, that Plato thinks fit to call the paradigmatic causes of sensibles, by the same names as sensibles, but Aristotle rejects such a sameness of appellation, as exciting in us a conception similar to the name.

and a progression to manhood and old age. However, though some things are the same both in capacity and energy, yet not at the same time, or not according to the same, but, for instance, a thing may be hot in capacity, but cold in energy: and many things act upon and are passive to each other; for each of these will be at the same time effective and passive. Hence, that which naturally moves is also moveable; for every thing of this kind moves, since it is also that which is moved[7]. To some, therefore, it appears that every thing which moves is moved. Whether, however, this be true or not, will be manifest from some other of our writings; for there is something which

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[7] Aristotle having previously assumed lemmas useful to the theory of motion, immediately employs the first assumption to the definition of motion; or rather he employs a certain part of it. For the division was that one thing is in entelecheia only, but another both in capacity and entelecheia, which was said to take place in each of the categories. Of this, therefore, which is both in capacity and energy, Aristotle says, motion is the energy, so far as it is in capacity. Thus in essence or substance, one thing is in capacity man, as, for instance, seed, but another in entelecheia, as Socrates. And in quantity something is a bicubit both in capacity and energy. Thus, too, something is white, both in capacity and energy, in quality: and in a similar manner in the remaining genera. But that Aristotle has in a wonderful manner defined motion we may learn from hence. For a thing being in energy that which it is said to be, as long as it thus subsists, cannot be said according to this to be moved. Thus, for instance, man, as long as he is man, will not be moved according to the human characteristic. But neither if he should be white in energy, as long as he is white, will he be moved according to whiteness. If, however, being a white man in energy, he should be black in capacity, as being capable of becoming black, when a departure happens to him from whiteness to blackness, so far as he is naturally adapted, that is, according to the ability which the energizer possesses of becoming black, then he is said to be moved to black. And again, when he is said to be black, there he stops in it, and is no longer moved according to the black, but is black in energy. Thus, therefore, nothing is moved, so far as it is in energy. Nor yet so far as it is in capacity, while remaining in capacity and in aptitude alone, can it be said to be moved. But when it is changed from capacity into energy, a subsistence in capacity still remaining in it, then it is said to be moved. Very properly, therefore, does Aristotle add, *so far as it is such*, that the energy of that which remains in capacity may be perfected: for a subsistence in capacity ceasing, there is no longer motion. For when a thing has acquired a subsistence in energy, so far as it is in energy, it is in stability and permanency, and not in motion. Nor yet if any thing is in capacity alone will it now be moved. That which is capable of being built, therefore, so long as it remains unenergetic, according to the capability of being built, is unmoved. But when so far as it may be built, according to this it energizes, still possessing, in the energizing the capability of being built, then it is moved, that is, when it is built. And building being then the energy of that which may be built, is motion: for as

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as far as it is built, it may be built, and accoring to a subsistence in capacity, it energizes and is moved.

Simplicius adds, that Aristotle defining motion in the beginning, says that it is the energy of that which may be moved so far as it is such. But Alexander, Porphyry, Themistius, and other interpreters of the definition, perceiving that Aristotle shortly after calls motion the entelecheia, and finding it thus written in certain copies, i. e. "motion is the entelecheia of that which is in capacity, so far as it is such, assume in the definition of motion, the word *entelecheia*, as the same according to Aristotle with *energy*. But perhaps Aristotle uses the word entelecheia as significant of perfection. And if at any time he assumes it for energy, he does not assume it for any casual energy, but for that which is perfect, and because it possesses the perfect; for every thing is then contained in its own perfection when it exerts its own energies according to nature. Hence Aristotle defines soul to be the entelecheia of a natural and organic body, and which possesses life in capacity. Not that soul is energy, but that its perfection subsists according to energy. And since motion is an imperfect thing, Aristotle does not in vain directly call it energy, and not entelecheia. Alexander also well observes, that if motion is called by Aristotle the entelecheia of that which is in capacity, it is called entelecheia, so far as the energy according to it is the perfection of that which is in capacity; just as in habits, the perfection of habit is energy according to it. But in habits energy does not destroy habit, but renders it more perfect. But the energy of that which is in capacity according to its subsistence in capacity, when it ends in that which is energy, destroys that which is in capacity. Hence it will not properly be the entelecheia of that which is in capacity. For as we have said, the name of entelecheia manifests the possession of perfection; and when it is properly asserted of energy, is not asserted of casual energy, but of that which is perfect, and is established according to a subsistence in energy.

Hence that which is properly entelecheia is twofold, the one subsisting as a perfect quiescent form, in which sense the soul is said to be entelecheia; but the other energy according to this. But if at any time energy should be called entelechia, it is so called so far as any thing energizing exerts energies according to its own nature, whether its nature be imperfect or perfect. It must further be observed, also, that Aristotle now ascribes the name of energy in common both to the agent and patient: for motion is in common to both a rising tendency from a subsistence in capacity to a subsistence in energy. Aristotle, therefore, adduces the instance of that which may be built; but it will also be true to say of that which builds, that motion is the energy of that which is in capacity; for a builder when he does not build, being in capacity, when he energises is then moved according to the building power. And building is motion, being the energy of the builder, but the passion of the house. But Aristotle calls both by the common name of energy, so far as that which is in capacity on both sides is excited to that which is in energy. May it not, however, be said that which makes, when it is changed from a subsistence in capacity to a subsistence in energy, is moved as that which suffers, and not as that which makes. Hence all the examples which Aristotle adduces are passive; for the energy of that which makes so far as it makes, is perfect.

Aristotle having said that motion is the energy of that which is in capacity, so far as it is such, very properly adds that which is consequent to the definition: for since natural things are both in capacity and energy, though not according to the same, being, for instance, cold in capacity, but hot in energy, or if they are also according to the same both in capacity and energy, as, for instance, hot according to both, yet they are not so at once, but are now in capacity, and again in energy, or *vice versa*. Since, therefore, natural things thus subsist, on this account they are not moved only as matter, nor do they move only, as things incorporeal, but they are moved so far as they are in capacity, and they move so far as they are in energy. What Aristotle says, therefore, has this utility, for it assigns the cause not only of physical things being moved, but also of their being motive. It likewise properly solves a doubt urged against the definition of motion. But the doubt has an inquiry of the following kind in the first figure. Some things which are moved also move. All things which move are in capacity, and not in energy. Some things therefore which are moved are in energy, and not in capacity. So that not all motion is the energy of that which is in capacity, so far as it is such. The doubt, therefore, is solved through every thing which is moved being moved and suffering, so far as it is in capacity, but moving and making so far as it is in energy. For a subsistence in capacity is one thing to it, and a subsistence in energy, another. Hence the energy according to each of these is different, if not only to do but to suffer, is said to be in energy. For Aristotle being of opinion that motion is in that which is moved, says that it is the energy of that which may be moved, so far as it is such. But that a thing which is in capacity suffers and is moved, so far as it is in capacity, but acts and moves in energy, so far as it is in energy, is evident from the energy of each not being directed to the same: but the energy of that which is in capacity, is directed not to that which it is, but to that which it is naturally adapted to be. For that which is cold is heated, because it is not hot but cold, but is naturally adapted to be heated. And that which is hot heats, so far as it is energy, and not so far as it is not yet, but is naturally adaptd to subsist in energy, as is the case with that which is passive. Hence such things as being moved, move, are moved through subsisting in capacity, but move through subsisting in energy. For that which is cold, is heated indeed, as being in capacity, but refrigerates as being in energy. And if it were not in capacity, but in energy alone, it would not be moved nor changed into any thing else, but would remain in that in which it was. For it would not be naturally adapted to any thing else, but would alone energize and act so far as it was, and would not suffer. But if any thing was in capacity alone, and had not any thing in energy, it would not energize, nor would it either do or move any thing. For it would not have any thing according to which it could act; or rather it would not in short have any subsistence: for that which every thing is, it is in energy. Hence, some are of opinion that neither has matter any subsistence, since it appears to be passive alone, and neither to make, nor energize. But that which does not energize, is not any thing in energy, according to which it was necessary it should energize. Such, therefore, is the use of what is now said by Aristotle.

But it is well said by Aristotle that *some* things are the same in capacity and entelecheia: for not all things are of this kind; since intellectual and divine natures have nothing in capacity, be-moves, and is itself immoveable. But motion is the entelecheia of that which is in capacity, when being in entelecheia it energizes, not

cause they are essentially in energy, as Aristotle says. The celestial bodies, likewise, though they are bodies, yet have not in their essence a subsistence in capacity, since they are exempt from generation and corruption. According to local motion, however, not by changing from immobility to motion, but by not having all their parts every where at once, but different parts, in different places, they also possess a subsistence in capacity. Perhaps, too, as Simplicius well observes, they sustain a certain change in quality, according to their different habitudes and commixtures with each other, and are passive, according to something which is inherent in them in capacity. For they are disposed in one way from their conjunction, and in another from their trigonic, hexagonic, or tetragonic station, and again in another from their unfigured interval with reference to each other; as is evident from the different effects of such like differences. But though these being moved by first moving causes, move sublunary natures, yet they are not reciprocally moved by them, and according to this, they differ from sublunary natures. For these are reciprocally moved by the natures which they move, in consequence of being composed from the same elements, and from the same matter similarly adapted to the reception of contraries. Hence each is passive according to matter, through which it possesses a subsistence in capacity, but it operates according to form, through which it is in energy that which it is. For things which heat are in their turn refrigerated, and things which refrigerate are in their turn heated. This, too, perhaps, celestial natures suffer with respect to each other, operating on and being passive to each other.

Aristotle, Simplicius farther observes, having asserted that some things are both in capacity and energy, and on this account are moved according to a subsistence in capacity, but move according to a subsistence in energy, and that all things are not of this kind, but that there are some things which are alone in energy and not in capacity, which things are certainly such as alone move and are not moved,—very properly adds, that to some it appears that there is not any thing which moves being immoveable, but that every thing which moves is moved, the contrary to which he demonstrates at the end of this treatise, to which place also he defers the investigation of this point. And it is evident that those of the ancient physiologists were of this opinion, who admitted that there was either one or many corporeal principles of this; and also of the junior physiologists, the Stoics. For the ancients said that generated natures were produced according to separation, or commixture, or change in quality of the principles. Alexander says that this was the opinion of Plato. But that Plato says that *the one* and *the good*, and, in short, the First Cause, who moves all things to himself as the object of desire, is immoveable, is clearly evident from what is said in the first hypothesis of the Parmenides: for after taking away every motion from it, he adds, "*the one*, therefore, is immoveable according to every motion. And Alexander himself acknowledges that Plato asserts ideas to be immoveable. On which account he fancies that he can demonstrate a certain confusion in the words of Plato: for if, says he, to perceive intellectually is to be moved according to the Platonists, to be intellectually perceived is to move. If, therefore, ideas are intellectually not so far as it is that which it is, but so far as it is moveable. I say so far as it is moveable: for brass is in capacity a statue;

lectually perceived, they will be motive. But if every thing which moves is also moved, ideas will be moved, though they are supposed to be immoveable. That intellectual perception, however, is not said by Plato to be moved according to any species of physical motions, but according to energizing, which Aristotle also testifies of intellect, asserting that it is in its essence energy, is perfectly evident: for in the Timæus, Plato says that all true being subsists always with invariable sameness. But nothing among things which are moved either according to essence, or quantity, or quality, or place, can subsist in this manner. So that when in the 10th book of the Laws, he assimilates intellect to a sphere revolving with invariable sameness, he does not ascribe a transitive motion to intellect, neither according to the whole, nor according to parts, but an energetic motion; and, in short, a motion denominated according to a vital tendency from being to energy. Aristotle therefore, might learn from Plato, that intellect is immoveable, according to physical motions. If, indeed, what is now said by Aristotle is directed against Plato, it seems to regard his opinion concerning soul. For Plato conceiving bodies to be alter-motive, as well as Aristotle, says that they are proximately moved by soul, which is self-motive. And, indeed, that all the celestial orbs are proximately moved by soul, Aristotle also acknowledges, since in the 2nd book of his treatise On the Heaven, he clearly calls them animated. But Aristotle, indeed, says that soul is immoveable, denying of it all natural motions. And Plato demonstrates that it is self-motive, as being moved, indeed, by itself, but by its own motions moving bodies, which motions are not physical, but transitive energies of soul, and on this account they are also moved: for that Plato does not say that soul is moved according to physical motion, is evident from the following passage in the 10th book of his Laws: "Soul, indeed, is the leader of every thing in the heavens by its motions, the names of which are, to will, to provide, to consider, to consult, to opine rightly or falsely." So that soul is immoveable according to that motion which moves. And Aristole, according with Plato, says, that which primarily moves is immoveable, soul, indeed, being immoveable according to that motion which moves, but intellect, as being without transition in its energies; for since it is necessary that prior to that which is alter-motive, or moved by another, the self-motive should be the proximate cause of the alter-motive; so prior to that which is moved in any way whatever, that which is neither moved by another, nor by itself, or in other words the immoveable, must be the cause to the self-motive nature, both of being, and of being moved. Hence the self-motive nature possessing a duplicity, and unfolding the agent, together with the patient, is not sufficient to the condition of principle. But whether soul is that which first moves, it also is shown to be immoveable according to every motion which moves; or whether it be intellect, it is immoveable according to every transitive motion. Nor in these things is there any dissonance between Plato and Aristotle, except in the word self-motive: because Plato calls *soul* self motive, but Aristotle *the animal*, this being moved, indeed, by soul, which is immoveable according to that motion which moves, but is moved according to the body. And this, indeed, is consequent to the opinion of Aristotle, who does not think fit to denominate any other motion except statue; yet, at the same time, motion is not the energy of the brass so far as it is brass; since the essence of brass is not the same as something which is moveable in capacity; for if they were simply the same, and according to definition, motion would be the energy of the brass, so far as it is brass. They are, however, as we have said, not the same. And this is evident in contraries: for that which has the capacity of being well, and that which has the capacity of being diseased, differ from each other; (since otherwise to be diseased would be the same thing as to be well) but the subject, that which is well, and that which is diseased, whether it be humour or blood, are one and the same. But since that which is in capacity is not the same, according to definition, as that which is in energy, as neither is colour the same as that which is visible; it is evident that motion is the entelecheia of that which is in capacity, so far as it is in capacity. That there is this energy, therefore, and that a thing then happens to be moved, when this energy exists, and neither prior nor posterior to it, is manifest. For every thing is able at one time to energize, and at another not; as, for instance, that which is capable of being built, so far as it is capable. And the energy of that which is capable of being built, so far as it is capable, is building: for building is either this, the energy of that which is capable of being built, or it is the house. But when the house is, it will no longer be that which is capable of being built. That, however, is built, which is capable of being built; and hence it is necessary that building should be the above-mentioned energy. But building is a certain motion. And the same reasoning will apply to other motions. That what we have asserted, too, is well said, is also evident from what others have said concerning motion, and from it not being easy to define it otherwise: for neither motion nor mutation can be placed in any other genus; nor have those who have advanced a different opinion concerning it spoken rightly. But this

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except that of natural things. Hence neither does he think fit to call the transitive energies of the soul motions. But Plato says, that the first species of motion (beginning downward) is the confused and disorderly, which belongs to a corporeal nature considered by itself; the second, that of natural things; the third, the transition in the energies of soul; and the fourth, that of intellect, which is, indeed, without transition, but is excited from being to energy.

will be evident to those who consider the affair; for by some motion is said to be difference, inequality, and non-being; though it is not necessary that any one of these should be moved, neither if they be different, nor if they be unequal, nor if they be non-beings. Neither is mutation into these, nor from these, rather than from their opposites. But the reason why they referred motion to these things is this, that motion appears to be something indefinite; and the principles of the other co-ordination, are indefinite, because they are privative: for no one of them is this particular thing, nor of a particular quality, nor does it belong to any other of the catagories[9]."

CHAPTER X.

LET us now proceed to the doctrine of Aristotle concerning place, time, and a vacuum; adducing what he says on each of these subjects, and adding the elucidations of Simplicius, as being no less remarkable for their accuracy, than for the perspicuity with which they are written.

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[9] Aristotle having related his own opinion, passes on to the consideration of the opinions of those prior to him concerning motion. And hence, as Simplicius well observes, it is more benevolent to consider Aristotle in this place as confuting the more confused description of motion delivered by the ancients. But it is evident, from their conception, that motion is well defined by Aristotle: for they referred motion to inequality, difference, and non-being, because it appears to be something indefinite: for their being two co-ordinations of things with the Pythagoreans, to one of which motion belongs, which has privative and indefinite principles, among which are difference, inequality, and non-being, motion very properly appeared to them as well as to Aristotle to be something indefinite: except that to them it appeared to be placed in the privative and indefinite co-ordination, through its opposition to the definite nature of permanency, but to Aristotle through the impossibility of placing it either in a subsistence in capacity, or a subsistence in energy. For that which is in capacity only is not yet moved, and that which is in energy is no longer moved. If, therefore, motion is neither in capacity nor in energy, nor that which it especially appears to be, energy; for motion is imperfect energy, because that thing in capacity is imperfect of which motion is the energy,—if this be the case, motion deservedly appears to be indefinite. But Aristotle calls the principles of the other co-ordination of contraries, privative, viz. the ten which are enumerated in p. 13, because according to him form and privation are the principles of contraries; and the ten principles in the better co-ordination will be under form, but those in the worse under privation.

Of place, therefore, Aristotle thus writes, in the 4th book of his Physics. "What place is will become evident as follows: But let us admit concerning it such things as appear to be truly present with it essentially. First, then, we should think that place comprehends that of which it is the place, and that it is not any thing of that which it contains. And again, that the first place is neither less nor greater than the thing contained in it; and also, that it does not desert each particular thing, and is not separable from it. Beside this we should think that every place has upward and downward, and that every body naturally tends to and abides in its proper place; and that it does this either upward or downward. These things being admitted, let us survey what remains. But it is necessary that we should endeavour so to conduct the speculation, that what place is may be unfolded; so that the doubts may be solved, and the things which appear to be present with place may remain; and beside this, that the cause of the difficulty and of the doubts about it may be manifest: for thus each particular will be exhibited in the most beautiful manner.

In the first place, therefore, it is necessary to understand that place could not be investigated, unless there were some motion according to place: for on this account we especially conceive that the heavens are in place, because they are always in motion. But of this motion one kind is lation; and another, increase and diminution: for a change takes place in increase and diminution; and that which was formerly here is again transferred into the less or the greater. But with respect to things which are moved, some are essentially in energy, and others according to accident. And of those which are according to accident, some can be moved essentially; as for instance, the parts of the body, and the helm of a ship; but others cannot be so moved, but are always moved accidentally; as for instance, whiteness and science; for these thus change their place, because that changes in which they subsist[1].

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[1] Aristotle, having previously assumed common conceptions concerning place, and taught us what kind of a definition ought to be given of it, next, first reminds us what kind of things we should conceive to be properly in place, and then shows us what place is. But things which are properly in place are discovered from things which are properly moved according to place. For things

But as we say that a thing is in the heavens as in place, because it is in air, and air is in the heavens; so we say that a thing is in air, that is, not in the whole of air; but, on account of its extremity, and that which comprehends, we say that a thing is in air; for if the wholeo f air were place, the place of each particular thing, and each particular thing itself would not be equal. They appear however to be equal: and such is the *first place* in which a thing subsists. When, therefore, that which contains is not divided[2], but continued, then a thing is said to be in it, not, as in place, but as a part in the whole; but when it is divided

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things properly moved according to place are also in place; since we obtain a conception of place from the transmutation of bodies. Hence we acquire the following common conceptions about place: viz. that it is different from that which is in place; that it is equal to and separable from it; and that it possesses the differences of upward and downward, to which there is a transition, and in which there is rest. Aristotle, therefore, collects these many conceptions into the one cause of them, viz. motion according to place. He also shows, what are the two species of every kind of motion according to place, i. e. *lation*, which is alone, and perfectly motion, according to place; and *increase* and *diminution*. Aristotle, therefore, wishing to discover place from things which are moved according to place, first makes a division into things which are moved essentially, and things which are moved accidentally; calling also things essential, in energy. Thus, for instance, every body is essentially moved, when the whole of it, detached from every thing else, passes from one place to another; as the whole of my body when I walk, and a ship when it sails. But things which are moved accordiag to accident, are such as subsist in things essentially moved, either as parts, as my hand, and the helm of a ship; or as accidents, as whiteness and science. There is, however, a difference in these. For parts, though they are not essentially moved in consequence of being in the whole, because it is necessary that things which are essentially moved, and pass from place to plaoe, should be entirely detached from every thing else, yet these, when detached from the whole, may be moved essentially; so that when they are moved together with the whole, they possess in energy the being moved according to accident, but in capacity the being moved essentially. For accidents to things which are essentially moved cannot be moved essentially, nor do they even possess this in capacity; as for instance, whiteness, or science. For these when separated are incapable of being moved essentially, because neither, in short, are they separable; but these are always thus moved and changed, because that in which they are inherent is changed; for otherwise they are incapable of being moved either in energy or capacity. This being the case, it is proper to investigate place, from things which are essentially moved according to place, but not from things which are moved according to accident.

[2] That is, when that which contains is continuous with that which is contained, then that which is contained is in that which contains, as a part in the whole; but when it is divided, then that which is contained is in the extremity of that which contains, as in place, and in this primarily.

and touches, then it is in a certain first, which is the extremity of that which contains, and which is neither a part of the thing contained, nor greater than the interval, but equal to it: for the extremities of things that touch are in the same. And that which is continued is not indeed moved in, but together with it; but that which is divided is moved in it. And whether that which contains is moved, or whether it is not, it is not the less moved. Farther still: when it is not divided, it is said to be as a part in the whole; as for instance, sight in the eye, or the hand in the body; but when it is divided, or touches, it is said to be as in place; as for instance, water in a wine vessel, or wine in an earthen vessel. For the hand is moved together with the body, and the water in the wine vessel. Hence, therefore, it is now evident what place is; for there are *nearly* four things, of which it is necessary place should be one. For it is either form or matter; or a certain [3] interval between the extremes of a thing; or the extremes, if there is no interval beside the magnitude of the inherent body. But of these, it is evident that three of them cannot be place. Through containing indeed it appears to be form; for the extremes of that which contains, and of that which is contained, are in the same. Both therefore are boundaries, yet not of the same thing; but form is the boundary of the thing contained, but place of the containing body. In consequence, however, of that being frequently changed which is contained and divided, while that which contains remains, as water from a vessel, that which is between appears to be a certain interval; as if that which is changed were something beside body. But this is not the case; but any body whatever departs among those that are transferred, and are naturally adapted to touch [4]. If, however, there were any interval which is naturally adapted to abide in the same place, there would be infinite places; for water and air being transferred all the parts effect the same thing in the whole, as all the water in the vessel. At the same time too, the place will be changed; so that there will be another place of place, and there will be many places together. There is not however, another place of the part in which it can be moved, when the whole vessel is transferred, but the same place; for in that place in which they are contained, air and water, and the parts of water, are alternately transferred, and not in that place into which they pass, and which is a part of the place, that is the place of the whole heaven [5].

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[3] Aristotle, says Simplicius, asserts that there are four things, of which it is necessary place should be one: for it is either the form of that which is in place; or the matter of it; or the interval between the extremities of that which contains; which last was the opinion of some of the ancients, as Democritus, Epicurus, and the Stoics. Some also assert that Plato conceived place to be this. Or place is the extremities of that which contains. If, therefore, as Aristotle shows, it is no one of the three, it is necessary that place must be the fourth. But, with respect to this interval, the followers of Democritus and Epicurus say that it is a vacuum, so as at one time to be filled with body, and at another time to be left void of it. But the Platonists and Stoics say, that this interval is indeed different from bodies, but that it always contains body, so as never to be left void. Simplicius adds, that the word *nearly*, used by Aristotle, does not indicate an indefinite conception, but the caution of the philosopher. Since place, therefore, is neither matter, nor form, nor interval, it is evident that it will be the boundary of that which contains.

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[4] That is, which are naturally adapted merely to touch, and not to be united. For things which are united, as for instance air, to air and water, are no longer as in place, nor as in this vessel to which they are conjoined.

[5] Aristotle having mentioned the circumstances which persuade us to think that space is interval, and having also added the causes of this deception, now turns to a confutation of the hypothesis, in a certain respect employing a more obscure argument. This however unfolded is as follows: If place is a certain nature of interval essentially remaining, and not subsisting in body, three absurdities will follow; for there will be infinite places; and place will be changed according to place, so that place will be another place of place; and there will be many places together. But these things are impossible; and therefore place will not be an interval of this kind.

The truth of this conclusion will be apparent, if we suppose a vessel containing water or air, so transferred from place to place as that the water or air may be moved in it with its proper motion, fluctuating, or revolving in a circle. If therefore the interval pervaded through the whole water, the water, says he, and the air being transferred will make all the parts to be the same in the whole, as all the water is in the vessel. For, as in the alternate mutation of bodies, when air passes into that in which there was water, we form a conception of place, as was before observed, so the parts of water alternately succeeding each other in the fluctuation, each part will be in a part of the interval, that is in place essentially, since the whole interval pervades through the whole water: for those who say that place is the boundary of that which contains, say that the whole is essentially, but the parts accidentally, in place; since these are not proximately comprehended by it. But those who assert that place is an interval pervading through all things, these say that there are proximate and essential places of the parts; for in the interval each part is essentially contained.

Matter, also, may appear to be place if any one directs his attention to that which is at rest, and is not separated, but continued: for, just as

contained. But things which are proximately in place are detached from other things, as we have before shown, and the places also are separate. If, therefore, the parts of that which is continued are detached, as must evidently be the case if they are moved essentially, there will be infinite parts, and infinite places. But Aristotle, instead of saying that the parts will no longer be continued with the whole, but will be essentially in place, says that all the parts in the whole will do that which the whole water does in the vessel. But the whole water is transferred essentially, and was essentially separated in place. So that the hypothesis of the interval of place becomes the cause of the parts being essentially moved according to place, and subsisting in place. But this becomes the cause of the parts and the places being separated; and this is the cause of the parts and the places being infinite in energy. Since, however, the present discussion is about place, Aristotle adduces the doubt of the places, and not of the parts, as absurd. But if places are infinite in multitude, being intervals in energy, in the vessel also there will be an infinite magnitude. The like also must be said of the infinite parts in infinite places; for the quantity which consists of magnitudes infinite in multitude, will also be infinite in magnitude. Thus, therefore, it is concluded that there will be infinite places in the same interval, if place is interval.

A second absurdity mentioned by Aristotle follows, viz. that at the same time place will be changed, so that there will be some other place of place; for if the vessel which contains an interval in itself is transferred, this interval will be in the interval in which the vessel is; and thus there will be a place of place, which is absurd. A third absurdity likewise follows, that many places will be together; for the vessel being transferred, the interval which is between the boundaries of it will also be transferred, and will subsist in another equal interval, so that the things in the vessel will be in the intervals from the beginning, which were called places, and in those into which they pass when transferred. Hence, many places will subsist together with many other places of the same body. Will not therefore the same absurdities be consequent to the assertion that place is the extremity of that which contains? By no means; for it cannot be said that when the vessel is moved the water will be in another place, or the parts of the water; for they subsist in the same place, and not in another, as if interval were in interval. How, therefore, if the wine possesses the same place, both according to the whole and according to the parts, will it be moved from Thasus to Athens? To this we reply, that it is not moved essentially, for it remains in the vessel; but the vessel which contains the wine is moved and transferred, and not the wine itself, nor its parts, except according to accident. But if place were interval, bodies would be essentially transferred together with the vessels, and in a similar manner their parts, in consequence of separately changing the interval, and they would exist in different places, but not according to accident. The place, too, of each of these would be a part of a greater, and again, the greater would be a part of a greater, and this as far as the greatest place and interval, in which the universe is contained; for the authors of this hypothesis contend that there is a certain interval as if matter is changed in quality, something which is now white was formerly black, and that which is now hard was formerly soft, on which account we say that matter is something; thus also place appears to be something, through a phantasy of this kind. Except, however, that in the instance of water and air, this is said to be the case, because that which was air is now water; but in place, because where there was air, there is now water. But matter, as was before observed, is neither separable from the thing nor does it contain, both which are the properties of place [6]. If therefore place is no one of the three, viz. if it is neither form,

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val in which the whole world is contained, and is distributed through the whole of it; in a part of which every body is always ingenerated; for this assertion makes place to be a part of place, in the same manner as it makes interval to be a part of interval. We may however see, that those who assert place to be a certain interval in no respect different from the amphora, either make the wine to be moved essentially, or they must say that it remains perfectly unmoved in passing from Thasus to Athens; for they cannot be allowed to say that it is moved according to accident, because they assert that the amphora is similarly in the interval, and the wine it contains, and the parts of the wine.

[6] Aristotle having subverted the hypothesis that place is form and interval, now employs a similar method concerning matter; and, as on other subjects so likewise here, he first mentions the causes through which some one may fancy that matter is place. He likewise now assigns a more probable reason than before, and at the same time unfolds the intention of Plato in calling matter a receptacle and place. Afterwards he adduces the arguments through which it is not possible to think that matter is place. Wishing however to mention the probability of the similitude of place to matter, he appropriately assumes the hypothesis: for then, says he, matter may appear to be place when any one directs his attention to that which is at rest in place, and is not moved according to place: for things which are in matter are at rest, but are not moved in it. But it is perhaps better, says Aspasius, to dismiss him who introduces the similitude of matter and place, because matter flows; for place, as long as it endures, is at rest and is immoveable. Farther still; thus also matter may appear to be place, if we look to one of the postulates concerning place, viz. that place, and that which it contains, are continued; since also the form which subsists in matter is in continuity with and is not separated from it. But this is evidently contrary to what was before admitted concerning place. In such an hypothesis, therefore, Aristotle assigns the cause of the deduction from that which is properly place, to matter. But this is the similitude of the mode according to which we arrive at the conception of matter and place; for we apprehend that there is such a thing as matter, in consequence of seeing one and the same thing, which is now hard, but was formerly soft, and which is now white, but was formerly

form, nor matter, nor interval, in consequence of always being something different from the thing which is transferred: place must necessarily be that which remains of the four, viz. it must be the boundary of the containing body. But I call the containing body that which is moveable according to local motion. It appears however to be something great and difficult to apprehend what place is, both through its seeming to be at the same time matter and form, and through the transition of that which is borne along being effected in that which contains when at rest: For it appears that there may be a certain

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merly black; and which we call the subject of these qualities. In like manner, through the same auxiliaries, we also arrive at the conception of place; because, where air formerly was, there air is now. Aristotle, however, appears to have added a small difference, through which he subverts all the apparent similitude, when he says, "Except however in the instance of water and air, &c." For if the form which subsists in matter fashions the matter, and makes it to be essentially denominated, but that which is in place does not fashion the place, nor is any part of it, nor produces any one thing together with it, nor is place denominated according to it,—if this be the case, it is evident that there is a great difference between matter and place. But this, is common to them, to receive different things, remaining the same as they were before they received them. Hence also Plato called matter the place, region, and receptacle of forms. May not, therefore, essence or substance be called the place of accident? This indeed, so far as it is a receptacle, will not be remote from such an appellation, but it differs in this, that the things contained in matter and in place are essences in essences.

After this, Aristotle briefly reminds us of what he had before mentioned, viz. of the properties which distinguish place from matter. But they are these; place is separable from that which it contains; matter is not separable. Place comprehends that which is in itself; matter does not comprehend, but is comprehended by that which is in it. But how is matter said to be not separable, if forms accede to and recede from it in the same manner as bodies in place? In the first place, every thing which may be separated ought to remain, that thus it may be said to be separated; but form does not remain without matter; so that neither is it separated from matter, nor matter therefore from it. In the next place matter, together with form, make the composite to be one thing, matter being in a certain respect changed together with form, and on this account will not be separable; but place is then by itself, and has nothing in common with that which is in place. In short, not only with respect to form is it necessary to understand that matter is not separable, but also with respect to that which is material. For matter is not separable from that which is material in the same manner as place from that which is in place; since matter is not separable from the thing of which it is the matter, in the same manner as place is separable from the thing of which it is the place.

interval between, different from the magnitudes which are moved. The air also contributes something, which seems to be incorporeal: for place appears to be not only the extremities of a vessel, but also that which subsists between as a vacuum. As, however, a vessel is a place which may be transferred, so place is an immoveable vessel[7]. Hence, when any thing is moved in that which is moved, that also which is within changes its place, just as a ship in a river; so that it uses that which contains, rather as a vessel than as place. But place wishes to be something immoveable; and hence the whole river is[8] *rather*

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[7] Aristotle has thus far employed place and a vessel as the same, and has assigned in common, the definition of place and a vessel; for each is the boundary of that which contains, according to which it is conjoined with the thing contained. Thus, the *body* of a shell, for instance, is not a vessel, but the inward superficies, which remaining continued, the utensil has the power of a vessel. But now Aristotle adds the peculiarity of place and a vessel, viz. that place is in its own nature immoveable, but that a vessel may be transferred. Hence, if at any time place and a vessel are changed, yet each preserves its peculiarity; so that place is an immoveable vessel, and a vessel a place which may be transferred. As place too, is the boundary of that which contains, it is very properly said to be immoveable. For as a superficies it is of itself immoveable, and as place still more so. For how can place be moved according to place? It may however be said, that a vessel is especially said to be a vessel according to its inward superficies. To this we reply, that a vessel possesses the capacity of containing, which is common to place, according to superficies; but it subsists as an utensil, both according to body, and according to its being a body which may be transferred, and which is also itself the recipient of a certain body. Simplicius adds, that perhaps Aristotle did not previously assume, in the axioms concerning place, that place is immoveable, through the aid afforded by a vessel in the investigation of place.

[8] Aristotle here uses the word *rather*, because the whole river is not properly the place of the ship: for *all* the water of the river is not the boundary of that which contains, nor, in short, superficies, but body. But the *whole* river is *rather* place, so far as it is not moved together with the ship. And it is the *whole place* of the ship, because the ship moves in a part of it. Or shall we say, that neither is the river the place of the ship, but the whole river will be in place, as Alexander says, in consequence of the boundary of that which contains it not being moved together with it, and the ship will be in a vessel? and perhaps, says he, it may be said, that neither is the whole river the place of the ship, but of the water which it contains, if we understand by a river, not water, but the superficies of the earth comprehending water: for it may be more congruously said of this, "hence the whole river is rather place:" for this superficies of the earth, being immoveable, is properly the place of the water which is comprehended and moved

rather place, because the whole is immoveable. So that the first immoveable boundary of that which contains is place.

And on this account the middle of the heavens, and the extremity of the circular motion which is toward us, appear to be especially common to all things, this above, and that beneath; because the one always abides; and the extremity of the circle also abides, possessing a sameness of subsistence. Hence, since that which is light is naturally carried upward, and that which is heavy, downward; the comprehending boundary which is toward the middle, and also the middle itself are downward; but the containing boundary which is toward the extremity, and the extremity itself are upward. On this account place appears to be a superficies, and, as it were, a vessel and that which contains. Farther still, place in a certain respect subsists together with the thing which it contains: for boundaries subsist together with that which is bounded[9]. Hence that body is in place, beyond

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moved in it; yet it is not primarily the place of the ship; but the ship indeed is in the water as in a vessel, and the water is in the bank of the river which contains it as in place. This therefore, will be the river which Aristotle calls the place, not of the ship, but of the water. And if this be admitted, it is evident that he calls a river, at one time, water, and at another superficies containing water.

Aristotle, therefore, having shown the difference between place and a vessel, and from this demonstrating the immobility of place, collects from what has been said a complete and perfect definition, viz. that place is the first immoveable boundary of that which contains; by the word *first* concisely manifesting the *proximate*, which he had before signified by the words, "according to which it is conjoined to the thing contained:" for a thing is said to be in place, both when it is in the inward superficies of the containing body, and when it is in the interior part of that which contains the thing contained. Thus, for instance, if a stone is in water, and the water is in unmoved air, the stone is comprehended in the superficies of the air, yet it is neither proximately nor primarily in it; nor is it conjoined, according to this, to that which is comprehended. Hence, neither is this properly place. The boundary also of a vessel is proximate to that which is contained, but it may be moved and transferred; on which account it is a vessel, and not place, unless the immoveable is assumed. But this Aristotle confirms in what follows.

[9] Aristotle proves that place is immoveable from the most proper differences of place; and these are, as has been already observed, upward and downward. He appears therefore to collect such a syllogism as the following. Place has for its differences upward and downward. That which has for its differences upward and downward, has also the middle and the extremity for its differences.

beyond which there is some other body that contains it; but that is not in place beyond which there is no such body. On this account, though

ences. That which has the middle and the extremity for its differences, has immoveable differences. That which has immoveable differences is immoveable. Place, therefore, is immoveable. And that place indeed has for it differences upward and downward has been already assumed: for the fifth of the axioms about place was, that every place has upward and downward. But that upward and downward are the middle and extremity, he shows from that which is light, when it tends to the extremity, and that which surrounds, being said to tend upward: for thus we say that fire when it tends to the surrounding ether, tends upward. And that which is heavy as earth, when it tends to the middle, is said to tend downward. But that the middle and extremity are immoveable Aristotle reminds us, when he says, "because the one always abides, and the extremity of the circle also abides:" for the middle, which is the centre of the universe, always abides, and also the earth which surrounds it; the latter always remaining both according to place and according to essence, in its wholeness and form, though it is changed in its parts, and in number. But the extremity with reference to us of a circulating body, which is the cavity of the lunar sphere, and the superficies which is toward us, always remains essentially the same according to number, both in the whole and parts. And although in its parts it is moved according to place, yet the * whole does not change its place, but always similarly remains, possessing local immobility. Let it also be observed, that Aristotle calls the hollow superficies of the lunar sphere, upward.

But that a thing whose proper differences are immoveable, is also immoveable, is evident; for differences and essential parts are constitutive of essence. At the same time it will be more evident from the following consideration. If the parts of a thing are moved, nothing hinders but that the whole may be unmoved, as in the parts of things moved in a circle; but if the parts are perfectly unmoved, so as neither to be moved essentially, nor according to accident, much more will the whole be unmoved. The immobility, therefore, of place is confirmed from our asserting that upward and downward are the differences of place, viz. the middle and the extremity. But the extremity of a circular motion with reference to us, will be the upward place; for things which are moved upward, being moved as far as to that extremity, are comprehended by and according to it. And that is the boundary of the comprehending circulating body, according to which it contains that which is comprehended. But what will be the place downward? for the centre is not a place, since it comprehends nothing. It is also impartible, and the most inward of all things. Nor is earth a place; for it is a body, and not a boundary. Nor yet is the boundary of the earth a place; for this is the form of the earth, and not place. Aristotle, therefore, solving these inquiries, adds, "the comprehending boundary which is toward the middle, and also the middle itself are downward; but the containing boundary which is toward the extremity, and the extremity itself, are upward." In which he also says what the places upward and downward are, and what the things

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* For when a sphere revolves about an immoveable centre, the parts indeed of the sphere are moved from one place to another, but the whole does not change its place.

though water should become a thing of this kind, yet the parts of it will be moved; for they are comprehended by each other. But the universe in a certain respect will be moved, and in a certain respect not: for so far as it is the whole, at the same time it will not change its place; but it will be moved in a circle; for this is the place of the parts. And some things, indeed, will not be moved upward and downward, but in a circle: but others, viz. such as have rarity and density, will be moved upward and downward[1]. As we have said, however, some things are in place according to capacity, but others according to energy. On this account, when that which is of similar parts is continued, the parts are in place according to capacity; but when they are separate, and touch, like a heap, then they are in place according to energy. And some things indeed are in place essentially; as for instance, every body which is moveable, either according to lation,

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things which they contain; for the middle itself, which is the earth, is the body in the downward place; but the comprehending boundary toward the middle is the downward place, being the boundary of the body containing the earth, which body partly consists of water, and partly of earth.

[1] Aristotle having defined place to be the first immoveable boundary of that which contains, well observes that, according to this definition, not every body is in place, but that only external to which there is some body comprehending it. Hence it follows, that neither is the inerratic sphere in place; for there is not any thing external comprehending it, if it is the extremity of all things; nor is the whole world in place; since neither is there any thing external to this; for if there were any thing external to it, it must either be a vacuum, and it will be shown that this has no subsistence; or it must be a body; and this must either be finite, and there will be something external to this, if every body is in place, and this will be the case to infinity; or there must be an infinite body external to it, which has been already shown to be impossible. Aristotle, therefore, wishing to persuade that the universe and the heavens are not in place, endeavours to accustom us to a still more paradoxical hypothesis: for though the universe, says he, should be supposed to be water, which especially requires to be in place, or in a vessel, yet at the same time the whole of such a thing will not be in place, because in short, every subject has not something externally comprehending it, the boundary of which, i. e. place is subjacent to that which is contained. The parts, indeed, of the water would be in place if they were separated, as now the parts of the universe are separated, and which, touching each other, and the one being comprehended by the other, are in place. But since things are said to be in place which are moved according to lation, on this account he syllogizes from local motion, and infers that the parts of the universe are indeed in place, but that the whole is not.

lation, or according to increase, is essentially somewhere. But heaven (i. e. the universe) is not, as we have said, any where totally, nor in one certain place, since no body comprehends it; but so far as it is moved, so far its parts are in place; for one part adheres to another. But other things are in place accidentally; as for instance soul and the universe; for all the parts are in a certain respect in place; since in a circle one part comprehends another. Hence the upward body alone is moved in a circle; but the universe is not any where: for somewhere, is itself something, and it is necessary that there should be something else in which this somewhere is, and which contains it. But beside the universe and the whole there is nothing external to the universe. Hence all things are contained in the heaven: for the heaven is perhaps the universe. But place is not the heaven, but a certain extremity of the heaven, and a quiescent boundary which touches the moveable body. Hence the earth is in water, this in air, and air in ether; ether is in the heaven: but heaven is no longer in any thing else[2]. But from these things it is evident, that this explanation of place being admitted, all the doubts may be solved: for neither is it necessary that place should be co-increased: nor that there should be a place of a point; nor that two bodies should be in the same place; nor that there should be any corporeal interval: for that which is between place is any casual body, and not an interval of body. Place also is somewhere, yet not as in place, but as bound in the thing bounded: for not every being is in place, but only moveable body[3]. Every thing therefore tends

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[2] Aristotle proposing to show that the whole heaven and the whole world are not in place, he makes a division into all the modes according to which any thing is said to be in place: for some things are in place in capacity, and others in energy. Thus, continued quantities which are not yet parts, are said to be in place in capacity; just as when they are divided, they will be in place, according to energy: for that which is separate, and now divided, when it is comprehended by something, is in place according to energy. Again, such things are in place essentially as are naturally adapted to be moved according to place, either according to lation, that is, motion in a right line, according to which the transition from place to place is effected; for *lation* is one thing, and *circulation* another: or such things as are moved according to increase and diminution; for we say that these are in place, as being themselves moved according to place: for though they do not change the whole place, yet they receive and abandon a certain place. And hence these things are essentially in place. But having mentioned the three significations of a subsistence in place, viz. in capacity, in energy, and essentially, he shows that the whole heaven is not in any place, according to any of the above-mentioned modes of a subsistence in place: for it cannot be in place in energy, because there is nothing external with which it can come into contact, although it should be supposed to be in place in capacity, because it is not a part. Nor yet is it essentially in place, because it does not receive or abandon place. Nor in short, is it moved according to place, because it is neither moved according to lation, nor according to increase or diminution. But Aristotle adds the common cause of the whole heaven not being in place, according to any of these modes, viz. its not being comprehended by any body. Having also said that it is not in

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in short in place, because the whole is not moved according to place, he adds, "but so far as it is moved, so far its parts are in place. For it is moved neither upward nor downward, but in a circle. Hence, it is not itself in place, as not having any local transition. But its parts, viz. the celestial spheres, are in place: for the inward spheres are always comprehended by the outward, and are moved in the place of these; their parts at the same time changing their places. And in this they differ from the inerratic sphere, or the whole heaven, or the universe, that these do not change their place, not even according to their continued parts: for the continued parts of the inerratic sphere, admitting this sphere to be the outermost, do not change their place, because they are not in place, nor are comprehended by any thing externally.

It must be observed, however, that though the whole heaven, or the universe, is not properly in place, because there is nothing external to it, yet as the stars, and whatever exists in the outermost body, are in the boundary of that body, so far as it comprehends, and are therefore in place, the whole heaven may also be said to be in place, because we say that the whole is in that place in which the parts subsist. The whole heaven therefore is in place according to accident.

[3] One of the doubts concerning place was, if every body is in place, and in every place there is body, it will be requisite that the place of things which are increased, should also be increased together with them: for if this is not admitted, the enlarged body will no longer be in place. To this we reply, that the containing body recedes, either according to an antiperistasis, when that which is next in succession occupies the place of that which is elsewhere diminished; or according to condensation and compression, in which case, the boundaries give way, so that the things which are increased are in a greater place. When this happens however, place is not essentially increased, for no boundary is increased essentially. But the contrary takes place, when being condensed it is contracted. Again, neither is there a place of a point: for it is not necessary, if there is a place of a body, that the boundaries of it should also be in place; since these are neither separated, nor contained, as it is necessary things should be that are in place. In short, if continued parts are not in place, because they are not separated from the whole, much less will the boundaries of body be in place.

In the third place, Aristotle says, the doubt is solved which was first mentioned, viz. that neither is place incorporeal: for it has three intervals, length, breadth, and depth, by which every body is defined. And it is impossible that place should be body; for if it were, there would be two tends to its own place in a becoming manner: for that which is next in order and touches, but not by violence, is of a kindred nature; and being connascent indeed, they are impassive; but when they come into contact they are mutually passive and active. Hence every thing naturally abides in its proper place, not irrationally: for this particular part has the same ratio to the whole place, as a divided part to the whole; as for instance, when any one moves a portion of water or air. Thus also is air to water; for this is as matter, but that as form. Water indeed is the matter of air; but air, is as it were a certain energy of water. For water is air in capacity; but air is after another manner water in capacity. Afterward, however, we shall determine concerning these things; but the occasion rendered it necessary to speak about them at present: and what has now been obscurely said will be then more perspicuous. If therefore the same thing is matter and energy; for water is both, but is one in capacity, and the other in energy; it will subsist in a certain respect as a part to the whole. Hence also in these there is contact. But there is a coherence when both become one in energy. And concerning place indeed, that it is, and what it is, has been said [4]."

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two bodies in the same thing. This doubt therefore is solved from the definition of place: for the boundary of that which contains has not three intervals, nor is it body. Through the same definition also it may be shown that place is not corporeal interval, since this has three dimensions; so that he who asserts that place is a triply-extended interval, must also grant that two bodies may be in the same place, which does not happen to him who says that it is the boundary of body. The doubt of Zeno is likewise solved from this definition: for Zeno said, if every being is *somewhere*, place also will be in place. But if place is the boundary of that which contains, place also will be in something, *where* signifying a subsistence in something. It will not however be as in place but as boundary in the body of which it is the place. So that it will necessarily follow that place will not be in place; since a moveable body is indeed in place according to lation: but the boundary of that which contains is not essentially moveable according to lation; for it has not a separate subsistence.

[4] What is here said is not the solution of a doubt, but is added as the last of the axioms concerning place, viz. that every body naturally tends to, and abides in, its proper place. Aristotle therefore shows that this is consequent to the definition of place, and at the same time solves a certain objection which occurs. Hence, this also accords with the solution of the doubts: for

CHAPTER XI.

Of a perfect vacuum, which has no existence except in the heads of those who think it has, Aristotle writes as follows:

"After

how, it may be said, will the boundary of water be the place of earth, or the boundary of air the place of water, and so in succession, if it is necessary that place should be allied and similar to that which is in place; on which account also, it is said to be appropriate to it? But water is dissimilar, different from, and contrary to earth, and air to water, in consequence of changing into each other. Aristotle therefore says, that bodies which are next in order to each other, and touch each other without violence, are mutually allied and appropriate; air indeed to fire, for it has heat in common and compact with it; and on this account the mutation from air to fire is easy. But water is allied to air; for moisture is common to both. In like manner also earth is allied to water; for they have the cold in common. Earth, however, is not allied to air, nor water to fire. Fire also, though it has its begining in generation and mutation, yet, as in things of this kind, is the most appropriate of all things to the lunar sphere, and to that part of it which approximates to generation, or the sublunary region: for fire is luminous and immaterial, and has the relation of form to the other elements. Each, therefore, tending to its kindred body tends to its proper place. But Aristotle very properly says, not only *in a consequent order*, but touching: for things are successive or in a consequent order, when there is nothing of a similar kind between; as houses are said to be in a consequent order to each other when there is no other house between them. But things which are thus successive neither touch each other, nor is the one as it were in the place of the other. Contact, therefore, is necessary, that it may be place. He also necessarily adds, *but not by violense:* for some things may touch each other, not naturally but violently; and such as these are not of a kindred nature. If, therefore, kindred bodies, having a natural order with respect to each other, desire to be successive, and to touch each other without violence, these, when divulsed, will hasten to and abide in each other as their proper places. But since the parts are allied to each other and to the whole, yet are not in each other, as in place, or as in the whole place, he assigns the cause of this: for things which are connascent and continuous with each other, are impassive by each other; since it is necessary that which acts should be one thing, and that which is passive another. But things continued and connascent are one: and things which are not impassive, but act and suffer, these are not continued nor so allied as things which touch: for here the agent is one thing, and the patient another, but they approach and are allied to each other. They are not however so allied as parts which are from the same elements; but they have something common, and something different; and on this account they change into each other. These, therefore, are things which are in place: for bodies which when placed near to and touching each other act and suffer, these are naturally moved, and tend, as he says, as the imperfect to the perfect.

But

" After the same manner we must conceive, that it is the business of a natural philosopher to speculate concerning a vacuum, whether it is or not, and how it subsists, or what it is; just as concerning place: for it is attended with similar incredibility, and the belief in it is derived from the conceptions about it: for those who assert that there is a vacuum consider it as if it were a certain place and vessel. And it appears indeed to be full when it possesses the bulk which it is capable of receiving; but when it is deprived of this it is void: as if a vacuum, plenum, and place, were the same, but their essence not the same. It is necessary however to begin the speculation, assuming the assertions of those who say that there is a vacuum, and again of those who deny its existence; and in the third place we must consider common opinions concerning them. Those therefore who endeavour to show that there is not a vacuum, do not refute that which men wish to call a vacuum,

But Aristotle having said that the alliance of body is the cause of its tending to its proper place, he also says, that the same thing is the cause of its abiding in its proper place: for as that which is separated from its kindred nature, in consequence of desiring it, is moved toward it, so likewise when it has arrived where it is it desires to remain there; for it is *nearly* a part of it, by which it is comprehended according to nature. But it is *nearly* a part, because it is not a continued, but a divided part. As therefore it is natural to parts both to tend to their wholes, and abide in them, so likewise it is natural to things that are allied, when they are divided to tend to and abide in each other, as in their proper place: for as parts properly so called, as for instance, a part of water or air, preserves in its whole, an adaptation to it, both when the whole is moved, and when it is permanent, in like manner things which are allied according to another mode, preserve an appropriate subsistence; as for instance, water to air. But Aristotle supposes the part to be moved, that he may the more assimilate it to things in place: for water seems to be in a certain respect a portion separated from air, yet it is not a part or portion, in the same manner as matter, from which a composite is produced, characterised by form; for air is produced from water as from matter, in the same manner as a statue from brass, or rather as an animal from seed: since the water does not remain when air is produced.

But how does Aristotle say, " Thus also is air to water; for this is as matter, but that as form. Water indeed, is the matter of air; but air is as it were a certain energy of water," though at the same time he says, water is a part of air: for matter is not a part of form, but both are parts of the composite. In answer to this, it may be said, that the composite is especially essentialized, and characterized, according to form; or as Aristotle says, that water is air in capacity: for as seed appears to be a part of the animal produced from it, so water is, in a certain respect, a part of the air, generated from it, being air in capacity.

vacuum, but that which they erroneously assert, as Anaxagoras and others, who confute after this manner; for they demonstrate that air is something by twisting bladders, showing how strong the air is, and receiving it in clepsydræ[5]. But men conceive that a vacuum is an interval in which there is no sensible body; and fancying that all being is body, they say *that* is a vacuum in which in short there is nothing; and on this account, that what is full of air is a vacuum. Hence, it is not necessary to demonstrate that air is something: but that there is not an interval different from, and separate from bodies, and that it is not in energy, and does not pervade through every body, so that it is not continuous, as Democritus and Leucippus say[6], and many other physiologists, and that it is not any thing beyond all body, since body is continuous. These, therefore, do not meet the problem through the gate, but rather those who say that there is a vacuum. But one thing, indeed, which they say is this, that if there is not a vacuum there will not be local motion; and this is lation and increase: for motion would not appear to subsist unless there was a vacuum: since that which is full cannot receive. And if it could receive, there would be two bodies in the same thing. Certainly on this hypothesis any number of bodies whatever, may subsist together; for the difference cannot be adduced through which that which is asserted will not take place. But if this be possible the smallest may receive the greatest thing: for that which is great is many small things. So that if many equal things may be in the same thing, this also may be the case with many unequal things. Melissus, therefore, shows from these things that the universe is immoveable: for if it were moved, it would be necessary, says he, that there should be a vacuum; but a vacuum does not rank among beings. In one way, therefore, they thus show that there is a certain void[7]. But in another way, because some things appear to come together, and to be compressed; just as they say that wine is received by tubs, together with bladders, as if the condensed body would enter into the inherent void spaces[8]. Again, increase likewise appears to all men to be effected through a vacuum: for nutriment is a body; and it is impossible for two bodies to subsist together. They also adduce as an evidence, that which happens about ashes, which receives as much water as a void vessel[9]. The Pythagoreans

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[5] The clepsydræ, says Simplicius, i. e. *harpagæ*, were instruments for drawing up vessels of water from wells, These instruments, when they contained air, did not receive water; but immediately on the departure of the air, seized the water, which they did not dismiss, till the person who covered the cavity with his finger removed it, and thus permitted the air to enter in proportion to the water that ran out.

[6] Of this opinion also, says Simplicius, were Metrodorus the Chian, and some of the Pythagoreans, as Aristotle also shortly after informs us. This likewise was the opinion of Epicurus. Simplicius adds, that Porphyry does not write ουτε χωριστον ουτε ενεργειᾳ ον, *neither being separate, nor in energy*, but ουτε αχωριστον αυτων ουτε χωριστον, i. e. *neither inseparable, nor separable from them* (bodies). For Democritus, says Porphyry, asserted that this interval is inseparable from bodies, on which account neither is the universe continued, bodies being intercepted by a vacuum; but those, as the Pythagoreans, said it is separable, who asserted that there is a vacuum beyond the world, but admitted the universe to be continued. However, as Simplicius justly observes, the former reading is better, though the latter may also be defended: for of those who believed in a vacuum, some said, it was itself, separate by itself, pervading through the whole world, and extending in continuity beyond the world; but others said that it is every where dispersed through the pores of bodies, and on this account appears to be inseparable from them. Hence of the four following arguments, that from motion and increase introduces the first vacuum, but that from compression and ashes, the second. So that those who wish to oppose a vacuum, by showing that air is something, do not proceed to this conception or a vacuum through the proper gates, according to the proverb, and as it were entrances, but *beside* the gates, that is *externally* and through other avenues. But those speak more probably who say that there is a vacuum.

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[7] Aristotle adduces four arguments of those who say there is a vacuum; one, according to the conception of a separate vacuum; and three according to the conception of a vacuum dispersed through the pores of bodies. He also adds a fifth argument from the opinion of the Pythagoreans. But of the four arguments, the first is as follows: arising from a certain division of one asserting that local motion, which is beheld in lation and in augmentation, is either produced through an intermediate vacuum, or through a plenum. But it is impossible that it can be produced through a plenum, as will be shown. It must, therefore, be produced through a vacuum; and consequently there is a vacuum. And, indeed, that motion must necessarily be produced through something intermediate, appears to be self-credible to the intelligent, because the local transition from this thing to that, the thing *from which*, and that *to which*, differing from each other, must be effected through some interval between the two. But that every interval must necessarily be either full, or not full, is evident: for the division is contradictory. But that which is not a plenum is entirely a vacuum. That it is, however, impossible for motion to be produced through a plenum he demonstrates through an hypothetic syllogism, as follows: If the motion of bodies, according to place, is through a plenum, body will penetrate body, and the smallest will receive the greatest. But this is impossible; since, if admitted, the water in a bowl might receive the sea. The antecedent, therefore, is impossible, viz. that motion should be effected through a plenum. He also shows the deduction, i. e. that the smallest would receive the greatest, through this, that, if in short, it received any other body from the first, so as that there could be two bodies in the same interval, the same also would receive another third, because it had received the double, and the whole again would receive another fourth, and so on in succession: for no reason can be assigned, why it should receive one and not many bodies: for one was full as also two. It will therefore, receive

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receive the greatest: for since it is great, it may be divided into many parts, equal to that small thing which was the subject at first: for that which is great, as Aristotle says, is many small things, and each of the small things in that which is great, being equal to the small subject which was at first, the whole also will subsist in it, and the smallest will receive the greatest, which is obviously absurd. It is evident, also, that if it should receive things equal, it will likewise receive things unequal to itself; for many equal things make the unequal. It receives, therefore, things unequal, and consequently the greatest; though for it to receive things unequal is absurd; and hence Aristotle does not omit to mention this absurdity.

But that the introduction of a vacuum from motion is ancient, is credible from Melissus using the deduction as evident, that if any being is moved, it is moved through a vacuum; and afterwards assuming this position, but there is not a vacuum, he adds, being therefore is not moved. Melissus, however, did not reason in this manner concerning a corporeal nature, nor concerning any thing partial, but about that which is intelligible and every way perfect; for he conceived that this is one and immoveable, demonstrating its immobility though its being all things, and through there being nothing beside it which can occasion it to be moved from the condition of being it possesses through a vacuum: for there is no vacuum there. Perhaps, too, neither is there any difference there, since it is all things; and non-being has no place in all-perfect being. And though it should be admitted that difference is there, according to which forms are separated from each other, yet difference also is being. And a vacuum has no place in all-perfect being, as neither has non-being.

"Let not your intellect this path explore,"

Says the great Parmenides.

[8] The second argument by which a vacuum is attempted to be proved, is taken from the following experiment. Let there be a tub full of wine; and let the wine afterward be poured out into bladders. The tub will now receive the same wine together with the bladders; but it was full with the wine alone. How, therefore, will a place be given for the bladders, unless we say there are certain void spaces in the wine, into which a part of the wine recedes, and which it fills; and that thus the wine is compressed and condensed. Hence it comes to pass that a place is left for the bladder.

[9] The fourth argument is assumed from another experiment, by which it appears that a vessel will

reans also say that there is a vacuum; and that it enters into the heaven, as if the heaven respired from an infinite spirit. They likewise assert that a vacuum is that which distinguishes natures, as if a vacuum were a certain separation and distinction of things in a consequent order; and that this first subsists in numbers; since a vacuum gives distinction to their nature [1]. So many, therefore, and such are nearly the arguments, from which some assert and others deny the existence of a vacuum.

In order, however, to understand which of the assertions are true, it is necessary to consider what the name signifies. A vacuum therefore appears to be a place in which there is nothing. But the cause of this is

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will receive as much water when it is full of ashes as when it is empty, which it would seem cannot happen for any other reason than because the ashes have many void spaces which receive the water, or receive the ashes when they are compressed.

[1] What else, says Simplicius, can be the meaning of these enigmas of the Pythagoreans than this, that the *difference* which is above the corporeal world, and gives separation to the forms that are there, being participated by the sensible world, produces the distinction and separation of the forms it contains; there being no vacuum in the incorporeal world. Thus the beautiful is different from the just, not because is is not just, but because it is all things according to the beautiful, through the union which is there *, and because non-being is not in that which is perfectly being. But in the sensible region, separation is produced through the introduction of non-being; for the monad is not the duad, and the duad is not the monad; and non-being, which subsists between these, is the vacuum which separates the forms in the world; just as *difference* in the incorporeal world, which is itself being, and is not called non-being, and therefore is not a vacuum, separates the super-mundane forms. The *difference*, however, which is there, is the cause of the void which is here; and on this account Plato in the Sophista † calls it in a certain respect non-being.

Simplicius adds, that Straton of Lampsacen, reduces these four arguments to two, viz. to motion according to place, and to the composition of bodies; but that he adds a third argument from attraction: for it happens, says he, that the magnet draws some pieces of iron through others, because the stone attracts through the pores of the iron, and the iron is at the same time drawn together with the body which it attracts; and this piece of iron, again attracts another which is next to it, and that another. This series too of pieces of iron is suspended from the stone.

* i. e. The beautiful participates of the just, and all other forms, but all its participations are stamped, as it were, with the character of beauty.

† See the Notes to my translation of the Parmenides and Sophista.

is that they fancied being to be body; but every body is in place: and in the place in which there is no body there is a vacuum. So that if any where there is no body, there there is a vacuum. Again, they fancied that every body is tangible; and that whatever has gravity or levity is a thing of this kind. From syllogism, therefore, it happens that a vacuum is that in which there is nothing heavy or light. These things, therefore, as we have also before observed, are syllogistically inferred. But it is absurd that a point should be a vacuum: for it is necessary that a vacuum should be a place in which there is an interval of tangible body. A vacuum, however, appears in one way to be called that which is not full of a sensible tangible body: and that which possesses gravity and levity is sensible according to the touch. Hence, some one may doubt if interval had colour or sound whether it would be a vacuum or not. Or is it not manifest that if it could receive a tangible body it would be a vacuum, but if not, that it would not be a vacuum? But, after another manner, a vacuum is said to be that in which there is not this particular thing, nor any corporeal essence. Hence, some say that a vacuum is the matter of bodies, who also say, though not rightly, that this very thing is place; for matter is not separate from bodies; but they investigate a vacuum as that which is separate"

CHAPTER XII.

"SINCE, therefore, we have sufficiently discussed the nature of place; and it is necessary that a vacuum, if it has a subsistence, should be place deprived of body, and we have shown how place subsists, and how it does not subsist; this being the case, it is evident that a vacuum does not thus subsist, neither considered as separate, nor as inseparable: for a vacuum cannot be a body, but an interval of body. On this account, a vacuum appears to be something, because place also appears to be so; and through the same causes; for those also direct their attention to motion, according to place, who say that place and a vacuum a vacuum are something beside the bodies that fall into them. But they fancy that a vacuum is the cause of motion in the same manner as that in which a thing is moved; and this resembles what some assert of place. There is not, however, any necessity that if there is motion there should be a vacuum. And, in short, a vacuum can by no means be the cause of every motion, for that reason which was concealed from Melissus: for a plenum may be changed according to quality[2]. But neither is it necessary that there should be motion according to place, on account of a vacuum. For bodies which are moved may yield to each other when there is no separate interval beside them. And this also is manifest in the revolutions of things continuous, as likewise in the[3] revolutions of humid natures. Bodies too may be condensed, not into a vacuum, but because the things inherent are expelled. Thus, water being compressed, the inherent air is expelled. Things likewise may be increased not only from the ingress of some body, but also by a change in quality, as if air should be generated from water. And in short the reason concerning increase[4], and that of water poured upon ashes, are respectively impediments to themselves: for either any thing whatever is not increased, or it is not increased by body; or two bodies may be in

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[2] Viz. A thing may become hot or cold without any change of place.

[3] Thus, for instance, the first body may pass into the place of the second because the second yields. The second also may pass into the place of the third; the third into the place of the fourth; and the fourth into the place of the first. Aristotle perspicuously demonstrates that this may be effected, from things which are moved in a circle, whether they are continued, as a wheel, or liquid as water which is rolled round in a vessel: for in these instances, all the parts are moved, and all change their place, yet they do not occupy any space which before was void, but mutually yield to each other.

[4] If any one, says Simplicius, indefinitely understands increase of things which arrive to a greater magnitude, it will be sufficient to adduce to him the mutation of water into air, and in short, of a body less to one greater in bulk; but, if he understands it of the increase which properly subsists through the intromission of food, he will not by introducing a vacuum, through the accession of food, be any longer subverted by other arguments, but will be caught, according to the proverb, by his own wings. Or, as Aristotle more properly says, the argument will impede itself: for in order that he may solve the common doubt about nutriment, he introduces a vacuum, at the same time not solving, but rendering the doubt more dubious: for either accretion is produced in consequence of the nutriment pervading through a vacuum, or the nutriment does not pass through

through the body. And, if this be the case, of what use will the hypothesis of a vacuum be, if body does not proceed through body, that which nourishes through that which is nourished. Or what will be the use of a vacuum if nutriment is a body, or if every part is not nourished and increased, which is contrary to evidence; for bodies are nourished and increased in every part. Or if bodies are entirely nourished and increased, either body will pervade through body, to avoid which, they suppose a vacuum, or every body will be a vacuum, if every body is indeed increased, but the increase is produced through a vacuum; so that body will no longer have a vacuum in itself, but will be itself a vacuum, and body and a vacuum will be the same thing. Hence, those who suppose a vacuum do not show that it has a subsistence, but endeavour to solve the common doubt concerning nutriment through a vacuum, and thus make the doubt still more dubious.

These doubts concerning nutriment, Aristotle solves in his Treatise on Generation aud Corruption; when he says, that not every part of the nutriment accedes to the body, but one part of it is carried off insensibly, and another is introduced; and that when the influx is greater than the efflux, then increase is produced; just as when the efflux is greater than the influx, decrease is produced: for nutriment subsists in the pores of bodies, and when it is assimilated, adheres to them. The whole body, however, is not a pore; but where a pore is now, there a plenum is produced; and that which is now a plenum, through effluxion becomes a pore. But the fourth argument was that which introduced a vacuum from ashes, since a vessel full of ashes receives as much water poured on the ashes as it would receive when empty; for, say they, either body pervades through body, which is absurd, or the water proceeds into the void spaces of the ashes. By these, therefore, says Aristotle, the doubt also is impeded: for avoiding the absurdity of body penetrating body, they are compelled to say that ashes are incorporeal, and void throughout, in order that the vessel may receive the same quantity of water, as if it did not contain the ashes: for if the ashes being body, could receive an equal quantity of water, it would thus follow that body would pervade through body, to avoid which they suppose a vacuum. Hence, these also endeavouring to solve the doubt by a vacuum, are impeded by it in the solution of the doubt. Eudemus, however, solves the doubt of the ashes in the third book of his Physics: for he says, that this may happen without void spaces; since something hot appears to be contained in the ashes, just as in a calx. But this is evident from hence, that when the water is poured in, both these burn; the calx indeed itself; but the ashes heat the water which pervades through them. And when this happens much vapour is exhaled, so that the masses are diminished through the vapour. Though they are diminished, however, the whole substance of the ashes is not consumed. Simplicius adds, it is possible, therefore, to give assistance both to those who suppose a vacuum, and those who introduce condensation, by saying, that not only the void spaces of the ashes solve the thing investigated, but also that those of the water subside, being impelled by the plenitude of the ashes, so as that they have not the same bulk with the water poured by itself on the ashes. This, then, is what in the same place; (they think fit therefore to solve the common doubt, but they do not demonstrate that there is a vacuum) or it is necessary that all body should be a vacuum, if it is every way increased, and is increased through a vacuum, The same reasoning also applies to ashes. That the arguments, therefore, from which they show that there is a vacuum may be easily solved, is evident."

CHAPTER XIII.

"AGAIN, however, we shall say, that there is not a vacuum so separate as some assert it to be: for if there is a certain natural lation to each of the simple bodies, as for instance, to fire upward, but to earth downward, and toward the middle, it is evident that a vacuum will not be the cause of lation. Of what then will a vacuum be the cause? For it appears to be the cause of motion according to place; and yet is not the cause of this [5]. Farther still; if it is any thing, as for instance a place deprived of body, whither will the body placed in it be impelled? For it will not be impelled in all directions [6]. The same reasoning also may

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Aristotle says in opposition to the arguments which according to his narration introduce a vacuum. But Straton also solving the argument which is derived from attraction, says that neither does attraction compel us to admit a vacuum: for in short it is not evident whether there is such a thing as attraction, since Plato himself appears to subvert an attractive power; nor if there is such a thing, is it evident whether the magnet draws through a vacuum, and not through some other cause: for those who thus speak, do not demonstrate but suppose a vacuum.

[5] For the cause of local motion is nature; but a vacuum is not nature; and therefore a vacuum is not the cause of local motion. But that nature is the cause of local motion, Aristotle clearly shows from the physical tendency of bodies: for if a tendency upward is natural to fire, but a tendency downward to earth, and a tendency to the middle to the middle elements, nature and not a vacuum, is evidently the cause of local motion.

[6] Aristotle having shown that a vacuum is not as the producing cause of motion, because the advocates for its subsistence do not introduce it as the producing cause, but as that in which, and as place, in which and through which it is necessary bodies should be moved, now very properly proceeds to show that a vacuum is neither a cause nor a concause, in the same manner as place in which bodies that are moved, are both moved and permanent; for if a vacuum is as a certain place,

may be urged against those who fancy that place is something separate into which that is carried which is borne along: for how will that which is in this be either impelled or abide? And the same reasoning will fitly accord to upward and downward, and to a vacuum; for those who say there is a vacuum make it to be place [7]. How therefore will body be in place, or in a vacuum? For this cannot happen, since the whole of some body is considered as being in a separate and permanent place: for a part of such a body, unless it is considered separately, will not be in place, but in the whole.

Again, if place is not separate from body, neither will a vacuum. But to him who considers this affair, it will appear that the contrary rather happens to those who say there is a vacuum, as if this were necessary if there is motion; I mean that nothing can be moved if there is a vacuum: for just as those who say that the earth is at rest through

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place, Aristotle having previously assumed that it differs from place in consequence of having no body in itself, but subsisting in a privation of that of which it is the recipiant,—if this be the case, and if an infinite body as they say be placed in it, whither will it be moved? for what difference of motion will a vacuum impart, so far as a vacuum? For it will neither impart a motion upward, nor a motion downward definitely. But if it is at once impelled in all directions, it will either be divulsed, or it will rather be the cause of permanency than of motion. Or rather, neither will it be the cause of permanency: for why should it rather abide in this place than in that? Aristotle employs the same argument in the third book concerning the infinite.

[7] Aristotle before subverted a vacuum from its similitude to the infinite, but he now attacks it from its similitude to local interval: for the same reasoning, says he, will be adapted to those who say that place is a separate interval, as is adapted to those who introduce this void interval; for how will every natural body be impelled to such a place; or how will it remain in it? for those who say that place is the boundary of that which contains, since they do not assume this boundary as a mathematical superficies, but as that which subsists in a natural body, the peculiarity of which the boundary also participates,—this being the case, since bodies on high differ from those beneath, the boundaries of them are likewise different, and the natural tendencies of bodies to these are different. But interval is every where without difference: for in this, in what does upward differ from downward? And in what does the aptitude of fire in this, differ from that of water. Thus also in a vacuum; for a vacuum is considered as nothing else than a separate interval, in the same manner as place, according to those who assert it, to be interval. If, therefore, local interval is not the cause of motion, it is evident that neither is a vacuum. In like manner, neither is it the cause of permanency: for why should a thing rather remain in this part of place, than in this part of a vacuum?

similitude; so likewise it is necessary to be at rest in a vacuum: for there is not any place in it where a thing can be more or less moved: since so far as it is a vacuum it has not any difference[8]. In the first place, therefore, because every motion is either from violence, or according to nature, it is necessary, if there is violent that there should also be natural motion: for violent motion is contrary to nature; and that which is contrary to nature is posterior to that which is according to nature. So that if motion according to nature is not present with every natural body, neither will any one of the other motions be present. Besides, how will it be natural, since there is no difference in a vacuum and the infinite? For so far as it is infinite there will be no downward, nor upward, nor middle; but so far as it is a vacuum, there will be no difference between the downward and upward; for as there is no difference in nothing, so neither is there in non-entity. But a vacuum appears to be a certain non-entity and privation. Natural lation however is different; so that things which are naturally moved will be different. Either, therefore, there will not be any where a natural lation to any thing, or if there is, there is not a vacuum. Farther still; things which are thrown are now moved, he who impels them not touching them, either through an antiperistasis[9], as some say; or because the air being impelled, impels with a swifter motion than that of the lation of the impelled body through which it tends to its proper place; but in a vacuum there can be nothing of this kind; nor can any thing be borne along, unless as that which is carried[1]. Again, no one can assign a reason why that which is in motion stops somewhere; for why should it rather stop here than there? So that either it will be at rest, or it is necessary that it should be borne along to infinity, unless something more powerful impedes [2]. Farther still; now it seems to be carried

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[8] Aristotle having dissolved the arguments which appear to prove the existence of a vacuum, and having shown that a vacuum is not the cause of motion, now evinces that the contrary to what they wished happens to the authors of this hypothesis: for they fancied that local motion could not have a subsistence, unless there is a vacuum. But he on the contrary shows that there cannot be a local motion, if there is such a thing as a separate vacuum. And in the first place, he adduces an argument tending to this, that a vacuum being a thing indifferent, that which is placed in it will not be moved in one direction more than in another; and therefore, that it will not be moved at all. But that when subsisting similarly with respect to every part of that in which it is contained, it will remain immoveable, may also be inferred from what is said by Plato in the Timæus, concerning the permanency of the earth in the middle: for he there says, "that a thing which subsists similarly with respect to the middle is in equilibrium:" for if it subsists similarly with respect to every part about itself, why should it rather proceed to this part than to that, since it has an equal inclination to every part: and every thing which surrounds it has on all sides a similar habitude about it? for why should it rather incline to this than to that part? If, therefore, a vacuum is entirely without any difference, it will also possess a similar habitude with respect to that which is placed in it, and that which exists in a vacuum will be similarly affected towards the whole of that in which it exists. Hence, it will be in equilibrium, and on this account will not be moved.

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[9] That is, the contest between two contrary qualities joined together.

[1] The design of Aristotle is now to show, that if there is a vacuum there is no such thing as violent motion; having before shown, that admitting a vacuum there can be no natural motion. But since violent motion is twofold, arising either from that which compels being present, and carrying, or impelling, or drawing it along, or from its not being present, as in things which are thrown, Aristotle frames his demonstration of the latter, omitting the former, as Alexander says, on account of its evidence. Now therefore Aristotle demonstrates that the violent motion which is produced by the absence of him who impels it, cannot be produced in a vacuum: for in the throwing which is effected in a plenum, the things thrown are moved, either by an antiperistasis of the air which is pushed before that which is thrown by the impetus of him that throws: For the air being more easily moved than that which is thrown, is pushed before it, and through violence acquiring a collected opposing force, impels what is moved. But this taking place in a continued succession, the motion of that which is thrown remains continued until the impulse of the surrounding opposing air gradually failing, the proper motion according to nature of that which is thrown vanquishes the impulse of the air. Plato also was of this opinion, as may be seen in his Timæus. Either, therefore, the motion of things that are thrown remains in this manner continued, or through the impulsion of the air which is violently compelled by him who throws: For in this case, the air being more easily moved than that which is thrown, as long as it possesses power from him who throws, impels that which is thrown, there being at the same time a conflux of collected air behind it, through the violence of the motion, and which also co-impels, until the power in it gradually failing, the natural tendency downward of the thing which is thrown subdues it. Thus, therefore, the cause of the motion of things thrown through a plenum is assigned. But in a vacuum neither of these can take place: for neither can there be any impulsion, or surrounding opposition, since there is nothing in a vacuum. But Aristotle having said, that no one of these can exist in a vacuum, and that there can be no local motion in it, he adds, "unless as that which is carried," indicating that it is impossible for that which is moved in a vacuum to be moved after the manner of throwing. If it is moved, therefore, it must be moved as things which are carried; and if it be thus moved, it must either be carried in the vacuum itself, or in some body. But it is impossible for it to be carried in a vacuum; for a vacuum, since it is nothing, is inefficacious. But if there should be any body which carries in a vacuum, and carries through violence, since that which is moved also itself moves, it is evidently moved either according to nature, but it has been shown that it is impossible for any thing to be naturally moved in a vacuum, or it is moved by violence; and if by violence, it is either thrown, and this is impossible, or

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or again it is moved as that which is carried, and this will be the case to infinity. But since, as we have said, one thing is moved violently, viz. as that which is thrown, but another is moved in consequence of that which moves being present, and employing compulsion, and this either by impelling, or drawing, or carrying, but carrying is more common, since to draw and to impel is after a certain manner to carry, this being the case, Aristotle adduces the instance of carrying instead of all the rest. It may however be said, what should hinder animals themselves from being moved according to their proper impulse, in a vacuum, and also other bodies, from being moved violently, either through being impelled, or drawn, or carried, or thrown? For it cannot be said of animals that they are definitely moved upward or downward according to nature. To this it may be replied, that the present discussion being physical, the discourse is now about natural motion, and not about that which is the effect of deliberate choice; for this latter is discussed by Aristotle in his treatise on the motion of animals. But things which are thrown, though they are thrown by animals, the mover not being continually present with them, yet possess a physical theory, in consequence of being moved contrary to their proper nature.

[2] Aristotle having before shown, that if there is a vacuum there is not motion, neither the motion which is according, nor that which is contrary to nature, now shows, says Simplicius, as it appears to me, that if there is a vacuum, not only motion is subverted, but also permanency according to nature: for natural permanencies are in the proper places of bodies, which proper places are different. But a vacuum is without difference. Why then should a thing which is moved stop here rather than there? So that if there is no difference in a vacuum, though some one should suppose bodies to be moved in it, it is therefore necessary they should be moved to infinity, unless something more powerful impedes; and though they should be said to be at rest in a vacuum, it is necessary that they should always be at rest: for if it is natural to them to be at rest in this particular part of a vacuum, it is evidently natural to them to be similarly at rest in all its parts. Hence it will be shown, that neither is it possible, if there is a vacuum, for any thing to stand still according to nature: for the words, "or it is necessary that it should be borne along to infinity," are added by Aristotle, as consequent to its not standing still naturally. But if the interpreters say that this is an argument that there will not be motion according to nature in a vacuum, because things naturally moved tend to their proper place, but there is no proper place in a vacuum, because it has no difference; if this be the case, it will be better to say that Aristotle having previously subverted motion, now subverts permanency; and this, as Simplicius justly observes, appears to be more consonant to the text, since the argument thus begins, "Again, no one can assign a reason why that which is in motion stops somewhere." But Aristotle omits to investigate what that will be in a vacuum which will impede motion as being more powerful; because it is evident that it is nothing: for this thing being permanent either according or contrary to nature, will

ried to a vacuum, because it yields; but in a vacuum a thing of this kind is similarly every way; so that it will be every way impelled. Again, what is said will be evident from the following considerations. We see the same weight and body more swiftly borne along, through two causes; either because there is a difference in that through which it is borne along, as when it moves through water, or earth, or air; or because that which is borne along differs, if other things remain the same, through excess of weight, or levity. Hence that through which it is borne along is the cause that it impedes, especially if it is borne in a contrary direction, and in the next place if it abides. But this is more especially the case with that which is not easily divided; and that which is more dense is a thing of this kind. Let the weight A, therefore, be impelled through B in the time G; but through D, which is more attenuated in the time E, if the length of B is equal to that of D according to the proportion of the impeding body: for let B be water, but D air. By how much the more attenuated, therefore, and incorporeal, air is then water, by so much swifter will A be impelled through D than through B. It will therefore have the same ratio of celerity to celerity, as air to water. So that if it is doubly more attenuated, it will pass through the space B in double the time that it will pass through D; and the time G will be double the time E. And thus always by how much the more incorporeal that is through which it passes, and by how much less it impedes, and may be more easily a divided, by so much the more swiftly will it be impelled. But vacuum has no ratio by which it may be surpassed by body; just as *nothing* has no ratio to number; for if four surpasses three by one, but two by more than one, and one by still more than it surpasses two, there will no longer be any ratio by which it surpasses nothing: for it is necessary that what surpasses should be divided into excess, and that which is exceeded: so that four will be divided into four, and nothing. Hence, neither can a line surpass a point, unless it were com-

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will impede. And, according to nature indeed, is impossible. If this also is impeded, there will be a procession to infinity posed from points. In like manner, neither can a vacuum have any ratio to a plenum; and therefore neither the motion through the one to the motion through the other[3]. But if a weight passes through so much space in such a time, through a most attenuated medium; in passing through a vacuum it will exceed every ratio: for let Z be a vacuum, equal to the magnitudes B and D. If, therefore, it passes through A, and is moved in a certain time, viz. in the time E, which is less than the time F, the vacuum also will have this ratio to the plenum[4]. But in as much time as E the weight A will pass through G a part of D. But it will also pass through it, even if there should be something in Z differing in subtility from air, in the same proportion as the time E to the time F; for if the body in Z is as much more attenuated than D as the time E surpasses the time F; vice versâ, the weight A, if it is borne along, will pass through Z with a celerity measured by the time F. If, therefore, there is no body in Z, it will pass through it with still greater celerity: but it was in the time F. So that in an equal time it will pass through a plenum and a vacuum. This, however, is impossible. It is evident, therefore, that if there should be any time in which any thing whatever is impelled through a vacuum, this impossibility would happen; for let it be assumed that any thing will pass through a plenum and a vacuum in an equal time: then there will be some body having the same ratio to another as time to time. And to sum up the whole in a few words, the cause of that which happens is manifest; viz. that there is a ratio of every motion to every motion: for it is in time; but there is a ratio of every time to every time, both being finite. But there is no ratio of a vacuum to a plenum. Those things, therefore, happen so far as the media differ through which they are moved [5]. But these, according to the excess of things which are moved. For we see that things which have a greater momentum, either of weight or levity if in other respects they possess similar figures, are more swiftly carried

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[3] Aristotle here says that a magnitude by so much the more resists motion, and causes motion to be slower by how much the more bulky it is, and the more difficultly it is divided. He now therefore declares how far it impedes motion, and how far it renders it slower, explaining the beautiful proportion between magnitudes through which motion is made, and the times in which things are moved: for by how much the more gross a magnitude is, so much the more time is required, that a thing may arrive at the end of that magnitude; and by how much the more subtle a magnitude is, by so much more swiftly will a thing pass through it. There is the same ratio therefore, between the celerity of motion through a lighter and the celerity of motion through a more gross magnitude, as between a more gross and a more subtle magnitude: Thus if water is twice as gross as air, the motion of the same weight through air will be doubly more swift than the motion through water; so that the same stone, if it consumes six hours in its descent through water, will consume three hours in a descent of the same length through air. But when Aristotle says that air is more *incorporeal* than water, he means nothing more than that air *less impedes* than water. And he concludes in general, that by how much less a body resists, and by how much the more subtle it is, by so much the more swiftly is a thing moved through it. In the additional notes to Vol. V. of my translation of Aristotle's Works, the reader will find what is here said illustrated by appropriate diagrams; and in like manner every thing that follows when diagrams are necessary.

[4] Aristotle having shown, through the first argument, that a vacuum has no ratio to a plenum, inferred from this that if there is motion through a vacuum, an impossibility will happen about motion and time, viz. that a finite motion, will be in no ratio to a finite motion, and that there will be motion which is not in time. But he now says that the motion in a vacuum will be in no ratio, even to that which takes place in the most attenuated medium, because the motion through a vacuum is without time, and he adduces the absurdities which attend such an assertion. He therefore now shows what consequences will result to those who suppose a temporal motion through a vacuum, and who assert that there is a ratio of the motions and times. On the contrary, it follows that there is a ratio of a vacuum to a plenum which he has shown to be impossible: for, as from their being no ratio of a vacuum to a plenum, it follows that neither is there any ratio of motions or times, so from admitting that there is a ratio of motions and times, it follows that there is a ratio of a vacuum to a plenum: for supposing that a motion through a vacuum is effected in a finite

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finite time, and assuming that there is the same proportion in the times of the motion and the media through which the motion passes, he collects an impossibility, viz. that a vacuum will have the same ratio to a plenum, as one time to another, that is to say, as number to number. And not only this, but that a vacuum will have the same ratio to a plenum, as a plenum to a plenum.

[5] Aristotle here shows the absurdities which result from supposing any thing to be moved through a vacuum in time: for if there is any ratio of motion to motion, and of time to time, both being finite, but there is no ratio of a vacuum to a plenum, it is evident that the motion through a vacuum will be without time. But if any one supposes that the motion through a vacuum is in time, since time has a ratio to time, and, as are the times in which the motion is performed, so also are the media through which the motion is effected, a vacuum also will have that ratio to a plenum, which a plenum has to a plenum; and a thing will be moved through a vacuum and through a plenum in an equal time. These, therefore, are the consequent absurdities.

through an equal space, and that according to the ratio which the magnitudes have to each other. So that this also will be the case in passing through a vacuum. But this is impossible: for through what cause will it be more swiftly impelled? For in a plenum this necessarily happens; since that which is greater more swiftly divides by its force. And that which is borne along, or thrown, either divides by its figure, or by the momentum which it possesses. All things, therefore, will be moved with equal swiftness; but this is impossible. From what has been said, therefore, it is evident that if there is a vacuum, the contrary will happen to that through which those who say there is a vacuum endeavour to prove its existence; for these fancy there is a vacuum separate and per se, if there is motion according to place. But this is just the same as to say that there is a certain separate place; and that this is impossible, has been already shown.

To those, also, who consider the affair by itself, it will appear that what is called a vacuum is truly a vacuum: for just as if any one puts a cube into water, as much water will give way as is equal to the cube; the like also happens in air, though it is immanifest to sense. Hence, in every body which may be transferred, so far as it is naturally adapted to be transferred, it is necessary, unless it is compressed, that it should be transferred, either always downward, if its lation is downward, as earth, or upward, if it is fire; or toward both, as air; or of whatever kind the thing may be which is locally situated. In a vacuum, however, this is impossible; for neither is it a body. But through the cube an equal interval may appear to permeate, which was before in a vacuum; just as if neither the water nor the air should yield to the wooden cube, but should permeate it throughout. The cube, however, has as much magnitude as the vacuum contains; which if it should also be hot or cold, or heavy, or light, would be no less, but would even be more essentially different from all passive qualities, although it is not separate from them. I mean the bulk of the wooden cube. So that though it should be separated from all other things, and should neither be heavy nor light, yet it would occupy an equal vacuum, and would be in the same part of a place and a vacuum equal to itself. In what, therefore, will the body of the cube differ from an equal vacuum and place? And if there are two of this kind, why will not also any thing whatever be in the same thing? This, therefore, is one absurdity and impossibility[6]. Farther still; it is evident that the cube when transferred to another place will have this [a triple dimension] which all other bodies have. So that if it in no respect differs from place, why is it necessary to make a place for bodies, beside the bulk of each, if bulk is impassive? for it contributes nothing, if another equal interval of this kind should be about it. Again, it is necessary that the quality of the vacuum, which is in things that are moved, should be manifest; but now it no where appears within the world: for air is something; but it does not seem to be [a body]. Neither would water appear to be a body if fishes were made of iron: for the judgment of that which is tangible is by the touch. Hence, therefore, it is manifest that there is not a separate vacuum[7]."

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[6] There is a great order of doctrine here, says Simplicius; for Aristotle first dissolved the arguments which appear to establish a vacuum. Afterward he shows that a vacuum is not the cause of motion, and that on this account it has no subsistence, if through this it is assumed; and then he turns the argument to the very contrary; for since, they say, if there is motion there is a vacuum, he shows by many arguments that if there is a vacuum there is not motion. In the next place, here proposing the problem by itself, he demonstrates that there is not a vacuum, again deducing the reasoning to an impossibility, i. e. that body will pervade through body, if there is a vacuum, to avoid which consequence they suppose a vacuum; for when one body is placed in another, as for instance, a wooden cube in water or air, it is necessary that what was previously inherent should give place to that which enters, and should either depart upward, if fire, or downward, if earth, or into that which is between, if it is any one of the middle elements. It is also necessary that so much should depart as is equal to the bulk of that which is introduced. This, indeed, is immediately evident in some things, as in a wooden cube placed in a vessel of water; for a quantity of water flows over equal to the bulk of the cube. But in some things this receding is not evident to sense. It may, however, Simplicius adds, be apprehended from certain machines; for in hydraulic organs, when, being full of air, water is poured into them, certain tongues being added to the cavities of the trumpets or pipes through which the wind makes its egress, they infer from the sound the egress of the air through these cavities. But if the body which was previously inherent has no egress whatever, and another is compelled to enter, that which was previously inherent, is either compressed into itself, and being contracted is condensed, so as that the vessel may receive as much of the body which is introduced, as the compression had contracted of the first body, or the vessel will burst rather than receive the other body. These things, therefore, being thus obviously apparent, what shall we say happens in a vacuum when any body is placed in it? Shall we say that an equal bulk of the vacuum will recede? But this is ridiculous, if that which is impossible can be said to be ridiculous; for that recedes which has a being. Will it therefore abide? An equal interval of the vacuum therefore will pervade through the cube. Hence if a vacuum is entirely nothing, we have the object of our investigation; but if it possesses a certain nature triply divided, how will it pervade through another triply-extended interval? For this is just as absurd as if water, not departing from the vessel that contains it, should proceed through a stone cube: for why should these be prevented from proceeding through each other, but a vacuum not? Shall we say that these are hot, or white, or heavy, or are replete with certain other passive qualities which happen to them, but that a vacuum is deprived of these? To assert this, however, would be absurd: for it has been before shown that bodies exist in place according to intervals alone, through which, also, being distant by parts, they require position: for though intervals are inseparable from other accidents, yet their existence, so far as intervals, which

CHAPTER XIV.

"THERE are some, however, who fancy that it is evident there is a vacuum, from the rare and the dense; for if there is not the rare and the dense,

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which definition is naturally adapted to separate, is different. A stone therefore does not occupy so much place because it is white, or black, or heavy, but because its interval is so much; though through its gravity it tends to this place. But when it is in place it is in place according to bulk; for to this alone, among the things belonging to the cube, the magnitude of place is consequent. Hence, though a stone cube should be supposed, all other accidents being separated from it, to be in interval alone, it would nevertheless occupy a space equal to that which it occupied in conjunction with other passive qualities. In what, therefore, will the interval of a cube differ from that of an equal vacuum and place? And if two such are in the same thing, why may there not be many, and infinite? By collecting, therefore, what has been said, we may see the necessity of the demonstration; for if body is in a vacuum, interval will be in interval, bulk in bulk, and body in bodies; for nothing hinders the other accidents of body, since they are incorporeal, from pervading through each other. If, therefore, it is impossible for body to be in body, it is also impossible for it to be in a vacuum. But Aristotle says, that what is called a vacuum is *truly* a vacuum, because it affords no utility whatever.

[7] Aristotle adds this second argument tending to the same thing; for if in every body, the interval being separated by definition from the passive qualities, i. e. from the accidents, differs in no respect from a vacuum, and bodies when moved and transferred are moved together with their proper intervals, why are other intervals of the like kind necessary to bodies? for if each, so far as it possesses interval, requires another interval, a vacuum also will require another interval, and that another, and thus we shall proceed to infinity.

dense, it is not possible for things to come together and be compressed. And if this does not take place, either, in short, there will not be motion, or the universe will overflow, as Xuthus said, or air and water will always be changed into the equal. I say, for instance, if air should be generated from a cup of water, at the same time as much water must be generated from equal air; or there must necessarily be a vacuum; for it is not otherwise possible that compression and co-extension can exist[8]. If, therefore, they call the rare that which has many void separate spaces; it is evident, that if there cannot be a separate vacuum, as neither is there a place which has an interval of itself, neither can the rare subsist in this manner.

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[8] Of the advocates for a vacuum, some say that it is something separate, subsisting by itself, as pervading through all bodies. They also assert, that according to one part of itself it possesses body, but that according to another part it does not, which they say is properly a vacuum, in the same manner as they call that which had this, place. But others assert that a vacuum is every where dispersed in bodies, according to small pores. Aristotle, therefore, having opposed the former opinion, now attacks the latter, viz. the opinion of those who say that if there is rarity and density there is a vacuum. He has indeed already opposed this assertion; for this is one of the four arguments mentioned in the beginning, in support of a vacuum. Now, however, he delivers this opinion more accurately, and adduces the subversion of it; for they not only say that rarity and density are subverted by the subversion of a vacuum, but that if there is not rarity and density there will not, in short, be motion; for there will neither be motion according to place, nor according to increase, nor according to change in quality, and generation; for, say they, motion according to place, is no otherwise produced, than by bodies being contracted and compressed, and affording a place to bodies that are moved through them, in the same manner as to those who walk through a multitude. Things, also, which are increased and extended in bulk, in consequence of others being condensed and contracted into their own void spaces, receive a place for increase. Such things likewise as become larger from smaller, and occupy a larger place, become such through compression and contraction. But there could be no compression, unless a vacuum was dispersed through bodies. In short, rarity not existing, it is not possible for any thing to become greater from being less; and rarity cannot exist, unless there is a vacuum for the reception of bodies. But neither could change in quality be effected without motion according to place; for it is necessary that things which are moved should approach near to each other, both that which changes, and that which is changed according to quality. They say, therefore, if there is not a vacuum there are not rarity and density: and that if there are not rarity and density, there is not motion; for if there could be motion without the existence of rarity and density, the universe would fluctuate, as Xuthus the Pythagorean says, and would cause an inundation, and be more widely extended, just as the seas, through the waves, inundate the shores. They add, that this will happen in things which are locally moved in a right line, through those that are moved impelling those that are near them; and in a similar manner it will happen in

But if they say that there is not a separate vacuum, but that at the same time a vacuum is inherent, this indeed is less impossible. It will happen, however, in the first place, that a vacuum is not the cause of all motion, but only of that which is upward: for the rare is light; and on this account they say that fire is rare. In the next place, a vacuum will not be the cause of motion as that in which; but just as bladders, because they are carried upward, carry also that which adheres to them, in like manner a vacuum will have a power of carrying upward. But how is it possible that there can be lation of a vacuum, or a place of a vacuum? for there would be a vacuum of a vacuum, into which it would be carried. Again, how can they assign the cause why a heavy body tends downward? And it is manifest, by how much the more rare a body is, and contains void spaces, by so much the more it will be impelled upward, so that if, in short, there is a vacuum, it will be most rapidly moved. Perhaps, however, it is impossible for a vacuum to be moved. And the reason is the same; because, as in a vacuum, all things are immoveable, so likewise a vacuum is immoveable;

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in things that are increased, because there is no compression through which a place may be afforded to things which accede; for in things which are moved in a circle a translation into a contrary part is alone effected. And when any condensed body is changed into one more rare, it is again necessary that it should be propelled, and cause an inundation. But again, this inundation would not be produced unless there was a separate vacuum external to the universe. So that the argument again comes to the same thing; for a vacuum being subverted, compression is subverted; and this being subverted, a vacuum is introduced; for the universe will not overflow into body, but entirely into a vacuum.

Simplicius adds, that there is also another fictitious hypothesis concerning generations; for it may be said, that when the water in a cup is changed into greater air, some other air equal to this changing into the water that was in the cup, preserves the equality. Or that fire sometimes being changed into air preserves the analogy. If, therefore, it is absurd to say that the universe inundates, and that equal mutations are produced, it is necessary, it may be said, that a vacuum should be mingled in bodies; for thus alone will there be compression and rarefaction, and none of the above-mentioned absurdities will follow.

moveable; for the celerities of a vacuum and a solid cannot be compared with each other[9].

Since, however, we say that there is not a vacuum, and it is truly doubted of the rest, hence, either there will not be motion, unless there is condensation and rarefaction, or the universe will overflow, or there will always be an equal quantity of water from air, and of air from water: for it is evident that more air will be produced from water. It is necessary, therefore, unless there is compression, or that which adheres is expelled, that what is last must be made to overflow, or an equal quantity of air must in some other place be changed into water, in order that the whole bulk of the universe may be equal; or if this be not admitted, it will follow that nothing can be moved; for some body being always transferred, this will happen, unless it revolves in a circle. But lation is not always in a circle, but likewise in a right line. These, therefore, through arguments of this kind, assert that there is a vacuum. *We, however say, from the things which are admitted,* that there is one matter of contraries, viz. of the hot and the cold, and of other contrarieties; also that from what is in capacity, that which is in energy is produced; that matter is not separate, but is different in essence; and that the matter, for instance, of colour, of the hot and of the cold, is one in number. The matter also of body, of the great and of the small, is the same. But this is manifest: for when air is generated from water, the same matter, not assuming any thing else, is produced; but that which was in capacity becomes in energy. And again, in like manner, water is generated from air; a change being made at one time into magnitude from parvitude, and at another from parvitude into magnitude. In a similar manner, therefore, if air passes from a greater into a less quantity, and from a less into a greater, the matter which is in capacity becomes both: for as the same matter from being cold becomes hot, and from being hot, cold, because it was in capacity, so likewise from being hot it becomes more hot, no part of the matter being made hot which was not hot before, when there was less heat. Just as if the circumference and convexity of a greater circle should become the circumference of a less, whether it be the same or another, the convexity would not be in any part which was not convex but straight; for it is not less or more by intermission. Nor can any magnitude of flame be assumed in which both whiteness and heat are not inherent. Thus, therefore, is the prior heat with reference to the posterior. So that the magnitude and parvitude of the sensible bulk is extended, the matter not assuming any thing; but because the matter is in capacity to both. Hence the same thing is both dense and rare, and there is one matter of these[1]. The dense also is heavy; but the rare, light; for there are two things in each, that is, in the rare and the dense: for the heavy and the hard

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[9] Aristotle here again divides a vacuum into the separable and inseparable. And he calls, indeed, the separable vacuum continued interval, subsisting by itself, and which is capable of receiving body, but does not receive it; but he denominates the vacuum which is not separable that which is dispersed in bodies; for these were the two hypotheses of the advocates for a vacuum. But he now divides the vacuum which is dispersed in bodies, into that which is dispersed according to large, and into that which is not dispersed according to large parts. And he says, that with respect to those who speak of the rare as that which has many void separate spaces, i. e. circumscriptions, it has been already shown that it is impossible there can be such a vacuum, so as that any thing can be moved through it. The same thing also was shown when it was demonstrated that place cannot be any separable interval. And in short, neither can the rare subsist in this manner. But if they speak of the rare, as if a vacuum were dispersed through the small pores of bodies, and is not separable from them, the hypothesis will indeed be more probable, and will appear to be less impossible. The absurdities, however, mentioned by Aristotle will happen: for in the first place a vacuum of this kind will not be the cause of all motion; but if of any, of the motion which is upward: for the rare which appears to be rare, through such a vacuum as this in it, is light, and tends upward; on which account they also say that fire is rare. What therefore will be the cause of motion downward?

In the second place, if a vacuum naturally tends upward, it will evidently be in the upper region as in place. The upper region therefore will be a vacuum; so that there will be a vacuum in a vacuum. After this, Aristotle adduces the absurdity consequent to those who say that a vacuum tends on high. For let this be the cause of motion upward; but what will they say of that which is heavy, and how will they assign the cause of its tendency downward? For a vacuum will not be the cause of this; since it, and the bodies in which it is, will not be attracted downward. Hence a vacuum is not simply the cause of local motion; but something else is the cause both of upward and downward motion. Aristotle also adds another absurdity from supposing a vacuum to be the cause of the upward lation of bodies; for if this is the cause of upward lation, as elevating bodies together with itself, a vacuum will evidently be by itself moved most rapidly, since in its motion upward it also carries bodies. And what absurdity, it may be said, is there in this? Because in short, it is impossible for a vacuum to be moved. Aristotle adds, that the reason of this is the same now as that which before showed that there will not be any motion in a vacuum, because a vacuum has no ratio to a plenum: for as is the time in which a vacuum is moved to the time in which a light body is moved, so is the vacuum to the body. But there is no ratio of a vacuum to a body, as neither is there any ratio of nothing to number. A vacuum therefore will not be moved in time: and hence it will not be moved. But Aristotle says *perhaps* it is impossible for a vacuum to be moved, because a light and rare body being properly assumed, what is asserted is indubitable; but that which is called light by them, is not from its own nature light, but from being mingled with a vacuum.

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[1] Aristotle admits that there is compression in bodies, but does not grant that on this account there is a vacuum, but after another manner assigns density and rarity as the cause, from the subject matter of bodies. Very properly, therefore, does Aristotle announce that he shall speak from things which are admitted, and have the relation of a subject *. For in the first book it is said that matter is a certain subject to contraries. There is also the same matter of the hot and the cold, and in like manner of the moist and the dry, and other contraries, which changes from one to the other, in consequence of always being in energy one of the contraries, and in capacity the other. And in subsistence, indeed, matter is never separate from one of the contraries, but in its own proper definition, and abstractedly considered it is different from these. Remaining also numerically the same it receives each of the contraries. As, therefore, of contrary qualities the subject matter is the same in number, as for instance, the matter of the hot and the cold, the white and the black, the sweet and the bitter; so likewise of the contraries in or about quantity, and together with the quantity of the great and the small in bodies, the recipient matter is the same in number: for if matter had in itself any magnitude whatever, it would not receive the contrary to that which it possesses according to nature, neither the greater, nor the less: as neither if it were naturally white would it receive blackness. But as it is deprived of other forms, so likewise of magnitude and body; and remaining the same in number it receives the contraries in magnitude. This is evident from the mutation from water into air: for another matter is not introduced when air is generated from water: for if the then existing matter was in capacity air, when it changes from a subsistence in capacity to a subsistence in energy, then air is generated, matter remaining the same in number, which before was water. A greater bulk also is produced, the former being smaller, neither the matter being mingled, nor a vacuum acceding: for the same matter would no longer be air in capacity if it became air from the mixture of any thing. In like manner, though water should be generated from air, it would be changed into a less bulk, matter by no means departing. But Aristotle makes this more evident by considering air as passing from a greater to a less, and from a less to a greater quantity, nothing either acceding or departing, but the air itself becoming condensed and attenuated, the matter in it possessing the power of becoming both, and changing from a subsistence in capacity to a subsistence in energy; thus also passing from a greater to a less bulk, and from a less to a greater. Since however it does not change from a privation of magnitude into magnitude, or the contrary, but from the greater to the less, or from the less to the greater, which is similar to the more and the less in qualities; on this account Aristotle shows in other qualities also, that as the same subject changes into contraries, so likewise into the more and the less: for as the same matter from being hot

* For in the original Aristotle says, "We however say from subjects," ημεις δε λεγομεν εκ των υποκειμενων.

becomes cold, and from being cold, hot, because it was both in capacity, so also from being hot it becomes more hot: for it does not change in such a manner as if certain parts of the subject not being formerly hot now become hot, as if that which is less hot, being such, mingled with things which are not hot; since when a body was less hot all the matter was similarly such; and when it became more hot, all the matter of it was similarly increased in heat. As, therefore, in these, so likewise in a body which is rarified and condensed, and which becomes greater and less, it is the same matter which receives both, and not any thing externally acceding or departing, as those assert who introduce a vacuum; for these are ignorant of the nature of matter, which remaining the same receives contraries. Aristotle, therefore, having shown in other qualities that the same subject remaining receives the more and the less, shows this also in figure; since though it is quality, yet it possesses an abundant communion with magnitude and quantity, for if a part of the periphery of a larger circle is bent so as to compose that of a less, it does not form a circle, because some parts of the periphery which before were not curved but right-lined, are now bent so as to compose a less circumference, but because parts which were less become more curved. Although, therefore, it should be said to be the same periphery which before was curved, but afterwards became more curved, or though the former should be said to be one periphery, and the latter another, this is evident, that the curvature does not accede as to a right line, but that which was less becomes more curved: for in short, the more is said to be less, not in a certain form failing in that which is said to be less, and not failing in that which is said to be more; since a certain form is not introduced, but the whole suffers intension or remission, as that which is more hot, or more sweet, or more white. Thus also in the parvitude and magnitude of a sensible bulk, the matter is not extended by receiving another magnitude, nor contracted by rejecting another, as those assert who introduce a vacuum as the cause, but the same subject remaining which was great in capacity, becomes, from being less, great in energy: for this it is, for the subject nature to be the recipient of contraries, which Aristotle manifests by asserting that matter is these in capacity. But as flame is both hot and white according to every part, in like manner also it is rare according to every part, and not according to the mixture of a vacuum. Thus also heat and the former heat with respect to the posterior, possesses the more and the less, not by any thing acceding or departing: for a certain form does not accede or depart, but the same thing suffers intension or remission. But he calls material, *sensible bulk*, in contradistinction to that which is intelligible and mathematical: for it is the sensible and material bulk which is extended and contracted. It must however be observed, that magnitude is a certain form, and that the great and the small are formal differences of magnitude; for they are reasons, or productive principles, which giving completion to forms proceed into matter: for as animals and plants derive their completion from the white and the black, the hot and the cold, and things of this kind, so likewise from their proper magnitude. And hence in every animal the greatest and the least magnitude have certain boundaries.

appear to be dense; and the contraries appear to be rare, viz. the light, and the soft. But the heavy and the hard are discordant in lead and iron[2]. From what has been said, therefore, it is evident that there is not a separate vacuum, (whether simply considered, or as in that which is rare) nor a vacuum in capacity, unless some one in short, should be willing to call a vacuum that which is the cause of lation. But thus the matter of the heavy and light, so far as it is such, will be that vacuum; for the dense and the rare, according to this contrariety, are effective of lation; but according to the hard and the soft, they have the power of producing passion and impassivity, and not lation, but rather change according to quality[3]. After this manner, therefore, let it be determined concerning a vacuum, how it subsists and how it does not subsist[4]."

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[2] Aristotle says that the heavy and the hard are discordant in lead and iron, because lead, though it is softer than iron, is at the same time heavier and rarer than it, in an equal bulk. Nor does he add this in vain, but for the purpose of indicating that the rare is also itself a certain form not subsisting according to the intervention of a greater vacuum: for if this were the case it would also be entirely lighter. Now, however, it does not appear to be so, since lead which is rarer and softer than iron is at the same time heavier than it.

[3] Of the avdocates for a vacuum, some contend that it is always separate in energy from bodies, but others in capacity, as being generated and corrupted in bodies. And of those who say that it is separate in energy, some assert that it is simply and by itself external to bodies, as those who place a vacuum beyond the world; but others assert that it subsists separate indeed, and as in energy, yet is not by itself, but is dispersed in bodies, and cuts off their continuity; which also becomes the cause of rarity. Aristotle has demonstrated, therefore, that there is not a vacuum, neither as subsisting by itself, nor as dispersed in bodies; so that it is not according to any mode, as that which is in energy, and separate. But when Aristotle says, that neither is there a vacuum in capacity, he means that which is not yet a vacuum, but which becomes different according to the interval of bodies; just as we say that pores are produced, in which there is always something more attenuated than the body which contains them. It is also evident, that if a vacuum in energy has not a progression into beings, neither will that which is in capacity: for that which is in capacity is every where that which is naturally adapted to be led into energy.

[4] In the beginning of the discussion about a vacuum, Aristotle proposed to investigate whether it is, or not, how it is, and what it is, and now concluding the discussion, he says, let it be thus determined how it subsists, and how it does not subsist: for it is not as that which may be separated in capacity, if it should be said that a vacuum is an interval deprived of body, either in

CHAPTER XV.

Let us in the next place direct our attention to the admirable manner in which time is discussed and unfolded by the Stagirite; subjoining also the commentary of Simplicius.

"It now remains, as consequent to what has been said, that we

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capacity or energy. But if any one should call a vacuum the cause of motion as matter, after this manner, he will admit that there is a vacuum.

Simplicius also informs us that Straton Lampsacenus endeavoured to show that there is a vacuum which intercepts every body, so as to prevent its continuity: for he says that light would not be able to pervade through water or air, or any other body, nor would heat, or any other corporeal power whatever, unless there were such a vacuum: for how could the rays of the sun penetrate to the bottom of a vessel. For if moisture had not pores, but the splendors pervaded it by force, it would happen that full vessels would overflow, and some of the rays would not be reflected to the upper part, but others pervade downward. This, however, Simplicius adds, may be solved from Peripatetic hypotheses, according to which, heat and other corporeal powers, and also light, being incorporeal, they do not require a void subject interval, in order to their subsistence and penetration; but they subsist in bodies without increasing their bulk. But if it should be said that light is a body, and a material body, adducing as a proof of this the sublunary light of the sun, reflexions, and the resistance of solids, because passive matter is mingled with them; even thus through rarity and density it is possible to solve the doubt: for nothing hinders bodies that are so rare as air and water, when they are condensed, from affording a place to the penetration of some of the rays. But such rays as fall into more dense parts, these are reflected. These doubts, therefore, may perhaps thus be solved, there being nothing in them to impede the subversion of a real vacuum; but perhaps what as yet been said does not subvert the existence of an interval which is by itself the receptacle of bodies, and which possesses aptitudes to the differences of bodies. For in condensations and rarefactions, it is necessary that there should be a certain receptacle, and another interval different from that of bodies, which may receive what is rarefied: for it is not effected in the body which approaches near, but in the interval from which the body that accedes, being impelled, or compressed, departs. Plato also appears to have rejected that which is in reality a vacuum, and an interval deprived of all body, and also to have assigned the final cause of this: for in his Timæus he says, "The period of the universe being orbicular, since it comprehends the genera of things, and such as from natural adaptation wish to coalesce, compresses all things, and does not suffer any void space to be left." For, in short, the existence of this vacuum in energy subverts the continuity and sympathy of the universe, and is of no real use.

should speak concerning time[5]. In the first place, then, it will be well to doubt concerning it, through[6] exoteric reasons, whether it ranks among beings, or among non-entities; and in the next place to consider what its nature is. That time, therefore, in short, is not, or that it scarcely and obscurely is, may be suspected from the following considerations. One part of it was, and is not; another part is future, and is not yet: but from these parts, infinite time, and which is always assumed, is composed. That, however, which is composed from things that are not, does not appear to be ever capable of participating of essence. To which may be added, it is necessary with respect to every thing partible, if it should have a subsistence, that either some or all of its parts should be when it is. But of time, some of the parts are past, others are future, and no part *is*, in consequence of time being divisible. But *the now*, or an instant, is not a part of time: for a part measures; and it is necessary that the whole should be composed from the parts; but time does not appear to be composed from instants. Besides, with respect to this now which appears to bound and separate the past and the future, whether it always remains one and the same, or is another and another, it is not easy to see: for if it is always another and another, but there is no part of time which is at once another and another, and of which one part does not comprehend, and another is comprehended, just as the less is comprehended by the greater time; but that which now is not, but was before, must necessarily once have perished; if this be the case, instants cannot subsist together with each other, but the prior instant must always have necessarily perished. It is not possible, therefore, that it can have perished in itself, because it then is. Neither is it possible, that a prior now can perish in another now: for let it be impossible for instants to adhere to each other in the same manner as it is impossible for a point to adhere to a point. If therefore, it does not perish in that which is successive, but in another, it will at one and the same time be in the intermediate instants which are infinite. But this is impossible[7]. Neither is it possible for the same instant always to remain: for there is not one boundary of any finite divisible thing, neither if it should be continuous to one thing, nor if to many. But the now is a boundary; and a finite time may be assumed. Again, if a simultaneous subsistence according to time, and to be neither prior nor posterior, is nothing else than to be in the same, and in an instant; in this case, if those things which are prior and posterior are in the same now, the transactions of a thousand years past will subsist together with those which are accomplished to day, and one thing will not be prior or posterior to another,. Such then, are the doubts concerning the particulars which belong to time[8]."

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[5] That a discourse concerning motion is most proper to a physiologist, is manifest, since nature is a principle of motion. But if all motion is in time, and some philosophers have been of opinion that time is motion itself, but others that it is something belonging to motion, it is evident that a discourse concerning time is necessary to a physiologist; for time is perspicuous and obvious to all men, though an accurate knowledge of its nature is concealed from the multitude. It likewise follows every thing natural and in generation, in the same manner as motion. Hence a discourse concerning time deserves the attention of the physiologist. But Aristotle having spoken concerning motion in the third book, and conjoined with it the consideration of the infinite, since motion is continued, and the continued is divisible to infinity, and is either infinite or finite,—this being the case, since all motion is produced in place and time, and since he has spoken concerning place, and has added a discourse about a vacuum, he very properly says, that the discussion of time is consequent to what has been said.

But time is attended with something wonderful, partly in common with other things, and partly peculiar to itself: for as colour and motion have an obvious existence, but it is difficult to apprehend the nature of their essence, thus also the existence of time is manifest not only to the wise, but likewise to all men: for we all speak of the younger and older, of yesterday, and to day, of to-morrow and formerly, and of this year, and the following. And what man appears to be ignorant of days and nights, of months and years? But if it is asked what time is, the wisest man can scarcely answer the question. And this, indeed, it has in common with other things: but it has this peculiar to itself, that its essence cannot be apprehended by sense, though it possesses certain auxiliaries from sense: for older and younger are not sensible objects, nor yesterday and to day, though at the same time they appear very evident to all men. So dubious, indeed, has the investigation of its essence appeared to be, that some being darkened by it have entirely denied the existence of time though it is so conspicuous. It is however absurd to subvert the existence of a thing through ignorance of its essence: for there are many things of which we are not only ignorant *what* they are, but likewise *whether* they are, and yet they nevertheless rank among beings.

[6] *Exoteric* reasons, says Simplicius, are such as are common, and are produced from opinion, but are not demonstrative and acroamatic.

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[7] Aristotle first assuming *the now* as being, demonstrates that it is not a part of time, and afterwards endeavours to show that neither *the now* which appears to bound the past and the future, and to separate them from each other, is any thing: for it is necessary if the now is, either that it should be the same or another and another. If therefore it is neither the same, nor another and another, it evidently is not. In the first place, therefore, he shows that it is not another and another, as follows: if the now is another and another, it is necessary that the former now should be corrupted. But it is impossible for the now to be corrupted. The now, therefore, is not another and another. And Aristotle indeed shows the conclusion from the prior and posterior now not subsisting together: for it is impossible for two times to subsist together, unless the one is more, and the other less, and the one comprehends, but the other is comprehended; as a year with respect to a month in it, and a month with respect to a day in it: for because the day of this month is present, the month also is said to be present. And thus they appear to subsist together

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together. But it is not possible in *nows* or *instants* that the one should contain, and the other be contained, or that the one should be a part, and the other a whole, or that the one should be more than the other: for they are not quantities, but the beginnings of quantities: and the more is in quantities. Hence they cannot subsist together, but it is necessary, if the now is another and another, that the former now should be corrupted: for that which having been before is not afterwards, is corrupted.

In the next place, Aristotle proves the assumption, when he says, it is impossible for the now to perish; and he proves this from division: for if it were corrupted, since that which is corrupted is corrupted in time, it must either be corrupted in itself or in another now. But it is impossible it should be corrupted in itself; for it then is. If therefore it is corrupted in another, since *nows* or *instants* do not adhere to each other, for time is not composed of instants, which he now supposes, but demonstrates afterwards; if this be the case, it will be corrupted in another now, which exists between it and that in which it was. But the intermediate *nows* are time, just as a line is between points. It was therefore in the intermediate time. But in the intermediate time there are infinite *nows*, if all time is divisible to infinity, as will be shown, and is divided according to *nows*. The now, therefore, will subsist together with those infinite *nows* which are in the intermediate time. But neither is the *now* corrupted in the intermediate time: for if this were the case, it would be requisite that some part of the *now* should be corrupted in each part of it. But the now is impartible. So that it will neither be corrupted in an instant, nor in the intermediate time. Besides, if the *now* is corrupted in some time different from itself, either that time is a *now*, and thus two *nows* will subsist together, that which is corrupted, and that in which it is corrupted; or it is time, and is either past or future. But if past time, the now was corrupted before it existed; and if future time, the now will not yet be corrupted, but will always be about to be corrupted: for that in which it is corrupted, is always about to be. And in short, time is past and future. But if the now were corrupted in time, the impartible would be co-extended with the partible.

[8] Aristotle having shown that the now cannot be another and another, in the next place shows, through two arguments, that neither can the same now according to number always remain, if

CHAPTER XVI.

"But what time is, and what is its nature, from what has been delivered, is similarly immanifest with the things which we have before discussed: for some say that it is the motion of the universe; but others, that it is the sphere itself. A part, however, of the revolution of the universe is a certain time; but it is not a revolution: for that which is assumed is a part of the revolution, and not the revolution. Again, if there were many heavens time would be similarly the motion of any one of these. So that there would be many times subsisting together. But the sphere of the universe seemed to those who made that assertion to be time, because all things are in time, and in the sphere of the universe. This assertion, however, is so stupid that it is not requisite to consider the impossibilities with which it is attended [1]. But since time

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there is not one boundary of any continued finite quantity, whether it is continued according to one dimension, as a line, or according to two, as a superficies, or according to three, as a body. But a line is bounded by two points, a superficies, by as many as the lines which contain it, and a body by as many as its comprehending superficies, this being the case, it is evident that *the now*, since it is the boundary of a finite time, will not be one and the same: for every time which we may assume, though it should be the least finite time, will have one now in the beginning of it, and another in the end: for each way it is bounded by *the now*; so that *the now* does not always remain one and the same. But it is necessary to assume a finite time, as that which is continued in a right line, of which kind also is time: for such things as these have not one boundary; though there appears to be one boundary of a sphere and a circle; for they are comprehended by one superficies, and one line.

In the next place, Aristotle shows by another argument that the same *now* cannot always remain: for if there is always the same *now*, all things will be in the same *now*, and there will neither be prior nor posterior. But things which thus subsist subsist together. Hence the most ancient things will exist together with the most recent; for both are in the same *now*.

[1] Aristotle having shewn from the above arguments that it is immanifest whether time has any existence, in the next place says, that he who attempts to consider it from what has been delivered will find that it is similarly immanifest with what has been before discussed, what time is, and

time especially appears to be motion and mutation, this must be considered. The mutation, therefore, and motion of every thing, is in that alone which

and what is its nature. It is immanifest, therefore, what it is, since some said that time is the motion and revolution of the universe, which Eudemus, Theophrastus, and Alexander, says Simplicius, conceived to be the opinion of Plato. But others said that it is the sphere of the heavens, as the Pythagoreans, who perhaps derived this opinion from the assertion of *Archytas*, who said that *universal time is the interval of the nature of the universe*. Some of the Stoics also were of this opinion. But others said that it is motion simply: for Aristotle relates three opinions concerning time, omitting the more mythological, in which, from division, he comprehends all in those assumed: for time is either motion, or that which is first moved, which is the sphere of the universe. And if it is motion, it is either every motion, or the motion of the universe; for the conception of time does not admit permanency, or any thing belonging to permanenc,. Aristotle therefore says but little in opposition to those who assert time to be the circulation of the heavens; but he speaks more copiously against those who say that time is simply the same with motion; and he does not think the opinion, that time is the sphere of the universe, worthy of contradiction, as being exceedingly absurd: for they appear to have called time the heavens because all things are in the heavens, and all things are in time. And it is evident that those who are of this opinion are in the first place ignorant of the ambiguity attending the subsistence of one thing in another, which Aristotle has well defined in his discussion of place: for a subsistence as in time is one thing, as in place, another, and as in whole, another. And in the next place the syllogisms are unskilfully formed; and hence he calls this opinion more stupid: for they syllogise in the second figure *, from two affirmatives, that heaven, or the sphere of the universe is that in which all things are contained, and time is that in which all things are contained; and on this account time is the sphere of the universe. But perhaps it might be possible to conclude this in the first figure. Heaven is that in which all things are contained; but that in which all things are contained is time. In the next place, the parts of time are the past and the future; but these are not the parts of a sphere. Time, also, has its subsistence in *becoming to be*, but this is not the case with a sphere. And the parts of a sphere are not every where, but time is every where: for in the *same* sphere the older and the younger are contained, but not in the *same* time. The sphere of the universe, likewise, is a certain corporeal essence, but time is not. This, however, as a most stupid hypothesis, Aristotle does not think worthy of discussion.

But he opposes the other, which says, that time is the motion and revolution of the universe: for a part of the circulation and revolution of the universe, as for instance, a day, is, according to the authors of this hypothesis, time, but is not a circulation: for a part of a revolution, is neither a revolution, nor a circulation; from which, Aristotle infers that time is not the circulation of the universe: for if a certain time is a part of the revolution, all time therefore is not the revolution. But that a part of the circulation is not circulation, though it be time, Aristotle evinces, when he says, " a part, however, of the revolution of the universe is a certain time; but it is not a revolu-

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* This is absurd, because in the second figure the major and minor terms always consist of a negative and an affirmative.

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which is changed, or wherever that may be which is moved and changed. But time is similarly every where, and with all things. Besides, every mutation

tion:" for a revolution is a motion from the same to the same. And then the universe is said to have made a revolution when each of its parts is restored from the same to the same. But the aforesaid time, such as day or night, is a part of the circulation but is not a circulation. And if you assume both together, viz. day and night, this time is more than the circulation of the universe, through the motion of the sun *.

After this, Aristotle adduces another argument against this opinion: for if there were many heavens, says he, that is worlds, as the followers of Democritus suppose, the revolution of each of these would be time; and thus there would be many times existing together, which is impossible: for it is possible that many motions may subsist together; but it is impossible for many times to be co-existent: for the same now is every where the same.

Simplicius further observes, that Alexander, endeavouring to show that it was the opinion of Plato, that time is the motion of the heavens, in the first place adduces Eudemus as an evidence of the truth of this: for Eudemus, according to Alexander, says " Plato adopted this opinion, and very absurdly: for he says, that prior to the generation of the universe there was confused and disorderly motion. He does not, however, connect line with line, since all motion is in time." In the next place, he does not admit those who assert that Plato, in conformity to the opinion of Aristotle, says, that time is the number of motion, when in the Timæus he calls time an eternal image, proceeding according to number: for he does not, says he, call time the number of motion, but that which is according to the number of motion, which is according to order. Thus far Alexander.

Simplicius, however, with his usual acuteness, answers him as follows: In the first place, whence came Eudemus to suspect that Plato called time the circulation of the heavens? In the next place, the absurdity which Alexander adduces does not happen to Plato, that there is time prior to time: for if, says Alexander, all motion is in time, it is evident that confused and disorderly motion also will be in time. If, therefore, such a motion was prior to the generation of the universe, time also was prior to the circulation of the heavens. Hence, if there was this time, time will be prior to time. In answer to this, it is necessary to observe, that we shall then understand how Plato says, that time is an eternal image moving according to number, when we understand Aristotle's definition

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* An astronomic natural day, of which Simplicius is here speaking, is that space of time in which an entire revolution of the equator is performed, together with a portion of the same equator, corresponding to that portion of the ecliptic which the sun in the mean time runs through: for if the sun, indeed, were not moved through the ecliptic, and if it returned with the same point of the equator with which it departs from meridian to meridian, then one entire revolution of the equator would precisely measure a day; but because the sun continually advances, and daily, by nearly one degree towards the east, it comes to pass, that the point of the equator returning with which the sun departed to the meridian, the sun returns with nearly one degree later.

This arises partly on account of the obliquity of the zodiac, and partly on account of the excentricity: for through this at one time, something more, and at another something less than one degree must be added. Hence, some inequality of days is produced.

tation is swifter and slower; but time is not: for the slow and the swift are defined by time; since that is swift which is much moved in a short time;

definition of time, that it is the number of motion. And Eudemus appears to have conceived that Plato called time the circulation of the heavens, from the following passage in the Timæus: "From hence, therefore, night and day arose; and through these revolving bodies the period of one most wise circulation was produced. And *month* indeed was generated, when the moon having run through her circle passed into conjunction with the sun. But year, when the sun had completely wandered round his orb. As to the periods of the other stars, they are not understood except by a very few of mankind; nor do the multitude distinguish them by any peculiar appellation; nor do they measure them with relation to each other, regarding the numbers adapted to this purpose. Hence it may be said they are ignorant that the wanderings of these bodies are in reality time." And thus he appears to say that each period is a certain time, and that the one period of the universe is the whole of time: for he says, "that the perfect number of time will then accomplish a perfect year, when the eight circulations, concurring in their courses with each other, become bounded by the same extremity; being at the same time measured by the circle subsisting according to sameness." That Plato, does not call time the motion of the celestial orbs, but the measure of motion, is evident from the above quotations: for when he says that the multitude in consequence of not knowing that the periods of the heavenly bodies are measured by numbers, are also ignorant that the wanderings of these bodies are time, he evidently shows that time possesses its essence through being the measure of motions.

But we shall still more clearly learn that Plato does not call motion and time the same, if we find, that when the universe was now moving according to reason, through the participation of soul, he then introduces time as the measure of motion: for he thus speaks in the Timæus, after the animation of the corporeal nature of the universe: "But when the generating Father understood that this generated resemblance of the eternal Gods moved and lived, he was delighted with his work, and in consequence of this delight considered how he might fabricate it still more similar to its exemplar. Hence as that is an eternal animal, he endeavoured to render this universe such to the utmost of his ability. The nature indeed of the animal its paradigm is eternal, and this it is impossible to adapt perfectly to a generated effect. Hence he determined by a dianoëtic energy to produce a certain moveable image of eternity: and thus while he was distributing and adorning the universe, he at the same time formed an eternal image flowing according to number of eternity abiding in one, and which receives from us the appellation of time." And is is evident indeed, that though all things were constituted at once by the demiurgus, the narration indicates their order with respect to each other: for if time was generated together with the universe, as is evident from what Plato says shortly after, it follows that the one did not precede the other in time. And how can any part of time be prior to time? But if the demiurgus introduced time to the universe when it was already in motion, it is evident that time and motion, according to Plato, are not the same; but in a certain respect time is perfective of motion. And, when Plato says, that the whole of a visible nature was moved in a confused and disordered manner prior to the generation of the world, he does not mean, as the words seem to indicate, that a disorderly sensible time; and that is slow which is but a little moved in a long time. But time is not defined by time, neither because it is a certain quantity, nor because it is a certain quality. It is evident, therefore, that time is not motion[2]. But there is no difference whether at present we say it is not motion, or that it is not mutation."

CHAPTER XVII.

"NEITHER, however, is time without mutation: for when there is no change in our thoughts, or if there is, but we are ignorant of it, then it does not appear to us that any time has elapsed; as neither did it to those in Sardis who are fabled to have slept with the heroes, when they awoke: for they conjoined the prior with the posterior now, and made them to be one, not taking into account the intermediate time, through not having had a sensible perception of it. As, therefore, if there were no other now, but one and the same, there would be no time, thus also when it is concealed from us that there is a different time, then the intermediate time does not appear to exist. If, therefore, it then happens to us that we do not imagine there is time, when we do not distinguish any

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sensible nature once presubsisted in time, and that the demiurgus afterwards, as if rising from a certain sleep, arranged it in order: for if he fabricated the world through goodness, and his goodness is always perfect and in energy, and *essentially* imparts good to all things, demiurgic providence is evidently consubsistent with the goodness of Deity. But Plato in thus speaking indicates that the demiurgus is the cause of *order* and *ornament* to the universe, which considered in itself, independent of the supernatural powers which it receives from an intellectual and divine soul, is full of a confused and disorderly motion. If, therefore, all motion is in time, it also is evident that the confused and disorderly time subsisting with such a motion, is nothing more than a certain adumbration of perfect time according to the hypothesis of the narration.

[2] Plotinus also adds another argument, to show that time is not motion: for motion, says he, may cease and fail, but time cannot. But though Aristotle here indicates that he uses indifferently *motion* and *mutation*, yet he demonstrates in the fifth book of this treatise, that they are not the same: for he shows that generation and corruption are mutation, but not motion.

any mutation, but the soul appears to remain in one and an indivisible, but when we sensibly perceive and distinguish mutation, then we say there has been time; if this be the case, it is evident that time is not without motion and mutation[3]. But since we investigate

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[3] Aristotle, says Simplicius, having shown that time is not motion, in the next place shows that neither is it without but entirely with motion: for it is the province of one who is endued with science, to show in things which are allied by nature, in what they differ, and what they have in common. But, that time cannot exist, and that it is not possible to assume it, without motion, he demonstrates as follows: Time without motion cannot be perceived by sense. That which cannot be sensibly perceived without motion, cannot be assumed without motion; because it entirely subsists with motion. Time, therefore, subsists, together with and cannot be conceived without motion. But that it cannot be sensibly perceived without motion he demonstrates from this, that when there is no change in our thoughts, or when we are ignorant that there is any change in them, then we do not think that any time has elapsed, as being unable to form a conception of time without a conception of motion. And that this is the case, is evident to us from sleep: for when we wake, after having slept without perturbation, we have no conception of the intermediate time. This also is evident in strenuous intellectual perceptions, or actions: for the mind being attentive to these, we do not think that there has been any intermediate time, though frequently a long time has elapsed: for not from being moved ourselves, but from receiving a conception of motion, we, together with this, conceive time as being consubsistent with motion. Hence, Aristotle says, when there is no change in our thoughts, because, in consequence of the mental perception of motion though the mind is immoveable, the co-sensation of time also is produced: for on the contrary we may see that those who when suffering pain, or who want or desire any thing, in consequence of conceiving that a motion of this kind is much, conceive also that the time is much. Hence, some one says in the comedy,

'Twill surely ne'er be day,
Yet long ago I heard the cock.

And another says,

Those who desire grow daily old.

But that those who do not mentally follow motion have not any co-sensation of time, we know every day, as I have said, from sleep. Aristotle, however, confirms this from that longer sleep which those in the island of Sardis are fabled to have slept with the heroes: for the nine sons of Hercules, which he had from the daughters of the Thespian Thestia, dying in Sardis, it was said, till the time of Aristotle, and perhaps of Alexander the Interpreter of Aristotle, that their bodies remained incorruptible and entire, and exhibited the appearance of men asleep.

The following singular circumstance, is also said by Eudemus to have happened at Athens. At a public tigate what time is, let us assume beginning from hence, what it is belonging to motion; for, together with motion, we have also a sensible perception of time: for even in darkness, and when we are passive to nothing through the body, if there is nevertheless a certain *motion*[4] in the soul, there immediately also appears to have been some time. But when likewise some time appears to have elapsed, together with this, there seems also to have been some motion. So that time is either motion, or something belonging to motion. Since, therefore, it is not motion, it is necessary that it should be something belonging to motion. But since that which is moved, is moved from something to something, and since all magnitude is continuous, motion is consequent to magnitude: for because magnitude is continuous, motion also is continuous; and because motion, also time: for as much motion as there was, so much time likewise always appears to have elapsed. But prior and posterior primarily subsist in place: and here indeed in the position of the parts. Since, however, there are prior and posterior in magnitude,

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a public sacrifice, certain persons had a banquet in a subterraneous cavern, and being intoxicated, they and their servants slept two days and nights. One of them indeed happened to wake, but as soon as he saw the stars, again returned to sleep. On the following day when they awoke, that part of the festival called *Koureotis,* was celebrated, from which they understood what had happened. But the *Koureotis* was the third day of the festival called *Apatouria;* just as the first day was *Dorpia,* the second *anarrusis,* and the fourth *epibda* *. After the sacrifice, therefore, of the second day, they slept the following day and night, and thought that the remaining fourth day was the *Koureotis,* instead of the third. From all that has been said, therefore, it is evident that time will not be without motion and mutation.

[4] It is evident from hence, that when Aristotle contends (as in his books On the Soul) that the energies of the soul are immoveable, he only means that they are immoveable according to physical motions, but not according to another species of motion which belongs to incorporeal natures, whose essence is separate from that of body.

* The first day of this festival was called *Dorpia,* from *Dorpos,* a supper, because on the evening of that day each tribe had a separate meeting, at which a sumptuous entertainment was provided. The second day was named *anarrusis,* because on this day victims were offered to Jupiter *Phratrios,* and *Apatenor,* and to Minerva, in whose sacrifices, as in all that were offered to the celestial gods, it was usual to *turn the head* of the victim *upward,* toward heaven. The third day was named *Koureotis,* from *Kouros,* a *youth,* or *Koura, shaving,* because the young men who till that time remained unshaved had their hair cut off before they were presented to be registered. And the fourth day was called *epibda,* from *following,* because it was a kind of appendage to the great festival. See Potter's Antiquities, Vol. I. p. 369.

it is also necessary that these should be in motion, analogous to the prior and posterior which are there. Moreover, there are also prior and posterior in time, because one of these is always consequent to the other. But the prior and posterior of these do not in reality differ from motion, but only in essence and definition. We likewise know time when we give a boundary to motion, distinguishing prior and posterior; and we then say there has been time when we receive a sensible perception of prior and posterior in motion. But we distinguish them by apprehending these to be another and another, and also by conceiving that there is something between, different from these: for when we understand that the extremes are different from the middle, and the soul says that there are two instants, the one prior, and the other posterior; then we say that this is time: for that which is bounded by instants appears to be time. And let this be admitted. When, therefore, we have a sensible perception of the now, as one, and there is not any thing as prior and posterior in motion, or when we perceive it as the same, and not belonging to a certain prior and posterior, then there does not appear to have been any time, because neither was there any motion. But when we perceive prior and posterior, then we say there is time: for time is this, the number of motion according to prior and posterior. Time, therefore, is not motion, unless so far as motion has number: an indication of which is this, that we judge of the more and the less by number, but of a greater and less motion by time. Time, therefore, is a certain number. Since, however, number is twofold, for we call both that which is numbered and that which is numerable number, and also that by which we number; time is that which is numbered, and not that by which we number. But that by which we number is different from that which is numbered[5].

And,

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[5] The whole intention, says Simplicius, of what is said is this, that as motion possesses its continuity from the magnitude in which it is, so likewise prior and posterior are appropriately derived from motion, subsisting according to position in magnitude, and from motion, time: for in magnitude, the *prior* for instance is where the champions in the games stand, but the *posterior*, the extremity of the stadium. But in motion, the *prior* is motion according to the first point, but the

posterior according to the posterior point. In magnitude, however, the prior is always consubsistent with the posterior: for the first point and the posterior subsist together. But in motion the prior being destroyed, the posterior succeeds. Prior and posterior, however, are not the same with motion, as neither in magnitude are prior and posterior the same with magnitude; but though in subject they are the same, yet they differ in definition. Thus five things are in their subject wood, but they are *five*, according to number. And the subject indeed of motion is the energy of that which may be moved; but the prior and posterior in motion are number and order in a thing of this kind. In like manner in magnitude, in which there are prior and posterior the subject perhaps is pillars, but prior and posterior are the order in them. Thus, therefore, Aristotle separating the prior and posterior in motion, in the next place inquires what the essence is of prior and posterior by which they differ from motion. Thus, in a line, as long as we conceive it to be one and continued, we do not conceive one part of it to be prior by position, and another posterior; but when we divide and distinguish it by points, then immediately we make one part of it prior by position, and another posterior, and the extremities of the line different from the middle, which is comprehended by the extremities. Thus also in motion, we do not conceive in it prior and posterior unless we divide and distinguish it as it were into two parts, and receive a sensible perception, as of another and another. By what, therefore, do we distinguish it? certainly not by a point; for a point has not position. We distinguish it, therefore, after another manner: for I call that the former motion with which I moved, if it should so happen, in walking; but the posterior, that with which I shall be moved. So that the distinction arises from the one being past, and the other future. But the past and future are time. Hence time and the prior and posterior are the same when these are distinguished. But they are distinguished when *nows* or instants are noticed by the soul, the one as the beginning, and the other as the end of motion: for then we immediately form a conception of the time which is between the *nows*, and which is different from them. Frequently, likewise, directing our attention to one *now*, as the end of the past, and the beginning of the future, we again obtain a conception of the prior and posterior time.

Hence, the conception of time is every where produced by apprehending the prior and posterior of motion: and this is apprehended when motion is asusmed as another and another, that is, when it is numbered: for number is not of one thing, nor entirely of the same thing, but of that which possesses another and another. So that time is the number of motion, as numbered according to prior and posterior. And that it is indeed the number of motion is evident, since we form a judgment of every thing which is more and less by number: but we form a judgment of the more and less of motion by time; for the motion is more which with an equal velocity consumes more time, and that is less which consumes less time. Hence it is concluded in the third figure, that time is a certain number. But that it is necessarily added, according to prior and posterior, is evident; since motions indeed are numbered, and many at once, as when a man at one and the same time is increased in bulk, and becomes hot, and moves from place to place: for then he moves with three motions at once, yet such a number of motion is not time, but that which is according to prior and posterior. Nor is it wonderful, if Aristotle, defining time to be that which is numbered of motion, does

not

And, as there is always another and another motion, so likewise with respect to time. But the whole of time, considered as subsisting at once,

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not mention in the definition the numerable, but number: for that which is numerable, is called number, in the same manner as that which may be measured is called a measure. Thus monadic number, which is measured by unities, is called a measure, and a number of oxen, and a number of horses. Thus again, a wooden bushel, and a bushel of corn, are called measures, and so in other things. And numerating number, indeed, is not adapted to time; for it is divided, and not continued; but numerable number may also be continued, as a spear of eleven cubits. That which is numerable also is twofold, one according to quantity, as when we say two or three motions; but the other according to order, as when we speak of motion according to the prior and posterior. Aristotle, therefore, wishes to show that time is the number of motion, both as numbered, and as numbered according to order; for this is its proper number: for there is a number common to motion, to oxen, and to horses. When, therefore, Aristotle says, "that which is bounded by instants appears to be time; and let this be admitted;" he indicates in what manner time is the number of motion, that it is the number of it as numerable and bounded, and not as that which numerates: for that which is numerable in motion, and is so bounded as another and another, is prior and posterior in motion, and not motion: for the number of the prior and posterior of motion is time, and not the number of motion itself. Hence time is the enumeration of many motions according to prior and posterior: for it is not the prior and posterior in magnitude; since the prior and posterior in it abide together; but the prior and posterior of time do not abide.

But, since it appeared to Alexander, says Simplicius, that the definition of time here given by Aristotle has not the same meaning with that given by Plato, let us compare their definitions with each other. Aristotle then says, that time is the number of motion according to prior and posterior; but Plato, that it is an eternal image flowing according to number, of eternity abiding in one; to the *one* opposing, *according to number*, to *abiding*, *flowing*, to *paradigm*, *image*. Here then we may see that Aristotle understood the conception of Plato concerning time far better than others: for what else is *an eternal image flowing according to number*, than the subsistence of time according to number, beheld neither as paradigmatic, nor as monadic, but as having the relation of an image, and subsisting according to the order of motion, i. e. according to prior and posterior? for the proper number of that which is moved, so far as moved, since it possesses another and another, introduces prior and posterior, and is bounded according to order. Aristotle, therefore, acutely perceiving this, and more clearly unfolding Plato's definition, says that *time is the number of motion according to prior and posterior*. Hence, if the words *according to number*, signify *according to order*, as Alexander conceives they do, they manifest nothing else than according to prior and posterior: for this is *tactic* number, or number according to order, just as *monadic* number is one, two, or three. We may also see how well Aristotle understood the word *eternal* according to the conception of Plato: for Plato says that *animal itself* possesses its perpetuity through eternity which abides in *one*; but Aristotle says that eternity derives its appellation once, is the same[6]. For the now is in reality one and the same, but its essence is different. The now, however, measures time, so far as it is prior

appellation from *being always* *, and that it possesses and comprehends the whole of time: thus beautifully unfolding the meaning of eternity *abiding in one*, and indicating that it illuminates all things with being and life. But the first participant of life is the first animal.

[6] Aristotle having shown that time is something belonging to motion, for it is the numerable of motion according to prior and posterior, confirms their alliance from that flux which is common both to motion and time: for as there is always another and another motion, the first not remaining, but being corrupted, so likewise the prior of time is always corrupted on the accession of the posterior. It is evident also, that not only the temporal priority of motion does not remain, but that this is likewise the case with the priority according to position: for in this the *prior* being corrupted, the posterior accedes; though in the same magnitude in which the motion is produced the prior and posterior remain together; for in those things alone which have their being in becoming to be, the prior is always corrupted on the accession of the posterior. The prior and posterior, therefore, in motion, not according to the position of motion, but according to the extension of being, is time, not so far as it is motion, but so far as it is prior and posterior: for with respect to the prior and posterior according to the position of motion, through which, to him who walks from Athens to Thebes, the first motion is near to Athens, though this prior and posterior have their being in becoming to be, yet, considered according to their relation to a permanent position, in a certain respect they appear to remain, when the motion also is beheld as co-extended with the magnitude in which it exists. But when it is properly beheld as motion, according to its flux, and possessing its being in becoming to be, then having the prior as the past, and the posterior as the future, it becomes chronical. But Aristotle having mentioned the agreement between time and motion, very properly adds their difference: for in motion not only the prior is different from the posterior, which is common also to time, but motions also which exist together differ from each other; some, indeed, in species, if one is corrupted, another increased, and another changed in quality; but others in number only, if many are at once corrupted, or increased, or changed in quality: for motion is in that in which it is moved; so that such as are the things moved, so many also are the motions. Nevertheless the same time is every where, according to a certain signification of

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* In order to understand what is here said, it is necessary to observe, that the intelligible order, which is the first procession from the ineffable principle of all, consists of *being*, *life*, and *intellect*. Of these three, the first or *being*, since it is wholly absorbed in the ineffable, and subsists in unproceeding union with *the one*, is called by Plato in his definition of eternity, *one*. The second of these three, or *life*, since it is *infinite*, is no other than venerable eternity. And the third, or *intellect*, is called by Plato *animal itself*, because it is the *first participant of life*. When Aristotle, therefore, says that eternity derives its appellation from *being always*, it is just as if he had said that it is *stability of being*, and this is equivalent to saying that it *abides in being*, i. e. according to Plato, *in one*.

time;

prior and posterior. The now also subsists as partly the same, and partly not the same: for so far as it is in another and another, it is different; but this was the now itself. But so far as the now is that which it once was, so far it is the same: for, as we have said, motion is consequent to magnitude, and time to motion. In a similar manner also that which is borne along is consequent to a point, by which we recognise motion, and the prior and posterior in it. But this is in reality the same, for it is either a point, or a stone, or something else of this kind; but is different in definition: just as the sophists assume that Coriscus in the Lyceum, is different from Coriscus in the Forum; and this also is different, because it is in a different and a different place.

time; and time does not differ from time; for neither is the difference of those things in which there is time, whether according to species, or according to number, the difference of time: for the things in Athens and the things in Corinth are in the same time, because the number of every definite motion is not time, in the same manner as there is a certain proper motion of every thing which is moved. But the number of all motions as one, is time: since prior and posterior, so far as such, are one and the same in all things which subsist together; for they do not possess prior and posterior, so far as one is in this, and another in that, nor so far as one is corruption, another increase, and another change in quality, but according to that which is common, so far as motion. Hence, things are said to be of the same age because they subsist together in the same time; just as there is the same five, though the things in which it exists are different. But difference according to time, is alone from the difference of the nows; for in the assumption of these time has its being when one of them is assumed as prior, but another as posterior. But if a difference in the *now* produces the difference in time, the difference in time also will be according to prior and posterior alone. Of the time, however, which exists at once, one part is not prior, and another posterior; and consequenly in such time there is no difference.

In short, time being the numerable of the first and simple motion of the heavens, according to the prior and posterior of this motion, numbers the prior and posterior in different motions, according to one appropriate now. Hence, also, the same time is at once every where. And Aristotle himself also, as we shall shortly see, considers the now as not only numerable, but as that which numbers. But if this be the case, so far as it numbers, it will be without difference, but so far as it is numbered, it will be different. We may also say, that different motions though so far as they are motions of a certain kind they differ from each other, yet that which is common to motion, viz. to have its subsistence in becoming to be, through which we assume prior and posterior in it, according to the extension of its being, and according to which time also is bounded, is one and the same.

But the now is consequent to that which is borne along, in the same manner as time to motion: for by that which is borne along we know prior and posterior in motion; but the now is, so far as prior and posterior are numerable. So that in these a real instant is the same; for that which is in motion is either prior or posterior; but the essence is different; because the now is, so far as prior and posterior are numerable. And this is especially known: for motion is known through that which is moved, and lation through that which is borne along; for that which is borne along is this particular thing; but this is not the case with motion. That which is called the now, therefore, is partly the same and partly not the same: for the like also may be said of that which is borne along[8]. But it is also evident, that whether time is not, there will

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[8] Aristotle having observed that time has this in common with motion, that it is generated and corrupted, and again, that it differs from it, because motions differ from each other, but all time is at once the same, says, that the cause of this is, that *the now is one and the same in subject*, for this is the meaning of the words ο' ποτ' ην, but that it differs in reason or definition, so far as the one is prior, and the other posterior. But according to this prior and posterior, the now has its being, and is the measure of time, according to which time is measured, as being another and another; just as number is measured by the monad. Very properly, therefore, does he consider the difference and sameness of time, according to the difference and sameness of *nows*. And the time will be the same, indeed, which is bounded by *nows* indifferently assumed, as that which is in different motions. Thus it is the same day, to-day, in which one thing is increased, another is whitened, and another walks, since they have the same now, both in the beginning and the end. But if different *nows* are assumed, in consequence of some being prior, and others posterior, time also will be different. Time, therefore, subsisting at once, though bounded by the same and different nows, will not be different.

Again, as Aristotle had before observed that motion is consequent to magnitude, and time to motion, this being the case, those things which are generative of, these, will also be consequent to each other. But a point is generative of magnitude, since a line is the flux of a point, and a line is the first magnitude. That also which is borne along, or which is in lation, is productive of motion, and the now is generative of time. As therefore the same point by its fluxion produces magnitude, and not by being added to another point, and as the same thing borne along produces motion, so also the now being the same according to subject, bounds and produces time by receiving prior and posterior numbered.

But that what is moved is the same in subject, Aristotle assumes as evident, because it is either a point, or a stone, or something else of this kind. And that it is indeed the same stone is will not be the now; or whether the now is not, time will not be: for as that which is borne along and lation subsist together, so likewise the number of that which is borne along, and the number of the lation: for time is the number of lation: but the now, with respect to that which is borne along, is as the monad of number[9]. Time also is continued through the now, and is divided according to the now: for

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is evident, though it becomes situated through its motion in different places; and that in the fluxion there is the same point is evident, from that which is generated being continued, and not being composed from the contact of points; but with that which precedes remaining, that which is next in order is connected, according to the flux of one point. The stone, however, which is borne along differs in definition, in consequence of becoming situated in different parts of that in which it is moved. But that this difference appears to take place Aristotle proves from the arguments of the sophists; who transferring this difference to the subject, seem to have collected this absurdity, that the same thing may become different from itself: for they say that Coriscus being the same, becomes at one time in the Forum, and at another in the Lyceum; but he who at one time becomes in the Forum, and at another in the Lyceum, becomes different from himself: for, in thus speaking, they do not preserve the different, according to the difference which is assumed, but transfer accidental to essential difference. He shows, therefore, that it is sophistical to suppose that from prior and posterior being different in definition, it follows that they are different in subject. And having shown how that which is borne along is the same in subject, but is different in definition, he says that the now also exists in a similar manner, since time follows and suffers the same things with motion, as was before observed, and the *now* with that which is moved.

[9] Aristotle having shown how the now subsists with respect to time, that it is as that which is borne along to lation, and that the now is more known than time, at present demonstrates the co-existence of them, again, according to their similitude to that which is born along and lation: for as, says he, that which is borne along and lation subsist, since it is impossible for the one to be without the other, if that which is borne along is assumed not according to essence, but so far as it is borne along, such also is the subsistence of the now and time. He also shows the necessity of this consequence from the analogy of that which is borne along and lation: for of that which is borne along the number is the now, this being as it were, a certain monad which adapts the indivisible to the indivisible. But of motion, time is the number: for as the monad by being assumed again and again produces number, thus also the now produces time, and that which is borne along lation. But time is the number of lation, not so far as lation, as has been already observed, but according to the prior and posterior which is in it: for time is not the same number of motion, but the interval which is between the prior and the posterior, these producing the interval by being again and again assumed. But the monad differs from that which is borne along and the now, so far as the monad makes number to be definite, but the other two cause motion and time to be continued.

according to this, time and the now are consequent to lation, and the thing which is borne along: for motion and lation are one with that which is borne along, because it is one; and not according to that which is; for it may fail: but also in definition. And this bounds prior and posterior motion. According to this, also, it is in a certain respect consequent to a point: for a point also, in a certain respect, connects and bounds length; since it is the beginning of one length, and the end of another. When, however, any one thus considers it, using one point as if it were two, it is necessary to stop, if the same point will be the beginning and end. But the now, because that which is borne along is moved, is always different. Hence, time is a number, not as of the same point, because it is both beginning and end, but rather as the extremities of a line, and not as parts; for the reason already assigned: for it uses the middle point as two points; whence it happens that it rests. And, farther still, it is evident, that neither is the now a part of time, nor *division* a part of motion; as neither are points parts of a line; but two lines are parts of one line[1]. So far, therefore

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[1] That the continuance of time and its division subsist according to the now, Arsstotle again shows from its agreement with that which is borne along and lation: for motion that is lation, becomes continued and one with that which is borne along, and not with any thing else. But it becomes one and continued with this, because he has shown this to be one according to the subject, which again he calls, *according to that which is*. Thus if a stone were that which is borne along, according to its being borne along, and not according to its being a subject, it will be the cause of continuance: for it may cease to be borne along; and then it will remain indeed what it is, but it will not produce a continued motion; since, though it properly remains one, yet its motion is cut off, being intercepted by permanency. Nevertheless, if it is assumed as one, according to the definition of that which is borne along, and as borne along, then it becomes the cause of the motion being one and continued. The *now*, however, does not only make time to be continued, according to its agreement with that which is borne along, but also divides it, by distinguishing the prior and posterior of motion; for thus time is divided. But the now, through continuing and separating, not only corresponds to that which is borne along, but also after a certain manner to a point: for when the same point is assumed, it is the beginning of one part and the end of another. It also continues the length, if it is assumed as one and the same in each part of it, and also divides it: for the division of length is according to a point. In like manner the

fore, as the now is a boundary, it is not time, but an accident of time; but so far as it numbers, it is number: for boundaries belong to that only of which they are boundaries. But the number which is of these horses, as for instance the decad, has also a subsistence elsewhere.

"That time, therefore, is the number of motion according to prior and posterior, and that it is continued, for it is of the continuous, is evident[2]. The least number, however, simply considered, is the duad; but

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the now continues and divides time. Hence through continuing and dividing it simply accords with a point; but so far as the same point is both beginning and end, we use the two as one; and it is necessary to stop in one point twice assumed, at one time as the end, but at another as the beginning; for its being is permanent in position. But that which is borne along cannot be twice assumed; for it is always another and another. It is, however, another, not because it is different from itself, but because it is another in another and another: for if it were twice in the same, it must necessarily stand still; but it is supposed to be continually moved. Thus also the now cannot be twice assumed. How, therefore, does time consist in the now being numbered? Not as the same point twice assumed as beginning and end, but as the two boundaries of a line this and that. But these bound the interval of the line which is between them, this interval being another and another. After this manner also *nows* are numbered, as another and another, the one being prior, but the other posterior. But to assume the now twice is impossible; since in this case time would stand still. There is no absurdity indeed in assuming a point twice, since it has position and abides; but the now does not abide, so as to be twice assumed. It is also evident that if a point is assumed as a beginning and end, the line will be divided according to it; and being divided, it is no longer continued; so that neither will the motion in it be continued. But time is continued, since motion also is continued. Time, therefore, is the number of *nows*, not as if the same now were twice assumed, like a point in a line, but since motion is different, as the beginning of one and the end of another. Nor is it beginning and end in the same manner as parts are frequently said to be the first and the last.

Indeed that *nows* are not similar to a point twice assumed, Aristotle shows, when he says, "for it uses the middle point, as two points; whence it happens that it rests." If time, therefore, does not rest, the now is not in it, as a point twice assumed, but as a beginning and end. But that it is not a beginning and end in the same manner as parts, but as boundaries, he again confirms from its similitude to things co-ordinate. Simplicius adds, that Aristotle calls the boundary of motion *division*, motion being divided according to this. And in his treatise concerning motion he calls this κινημα, *kinema*.

[2] Aristotle having observed that the now is a boundary in the same manner as the extreme points of the same line, since the now is indeed of itself the boundary of time, in consequence

but a certain number is partly the least, and partly not; as for instance, of a line the least number is in multitude two, or one; but there is not a least in magnitude; for every line is always divisible. Hence also similarly time; for one or two is the least according to number; but is not according to magnitude[3]. It is also evident why time is not said to be swift and slow; but much and few, and long and short: for so far as it is continued it is long and short; but so far as it is number, it is much and few. It is not, however, swift and slow; for neither is

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of time being nothing else than that which is numbered of motion according to prior and posterior, and that which is numbered consists of nows;—this being the case, he further observes, that when the now is assumed as that which is numbered of motion, then it becomes the boundary of motion, and it *happens* to it to be a boundary. Then also the now is assumed according to the subject, and is in that alone of which it is the boundary. But when it is assumed as the boundary of time, it is not an accident; for it is essential to time. And since that number which the now is, is every where, but the number which is every where is that which numbers, since the decad which measures ten horses, also measures ten men,—hence the now is at once every where, and is not in motion alone, of which it is the boundary not as *the now*, but as *kinema*, or, *that which divides*.

Aristotle concludes what he has said by adding, that time is continued, because it is the number of the continued: for time has its being in this, that it is the number of motion. The essence of time, therefore, being extended with the continuity of the numbered motion, will be itself also continued; for motion not failing, neither will it fail: for time being limited by the boundaries of motion, not so far as they are the boundaries of motion, but so far as they are prior and posterior, will also be itself continued, so far as it is time.

[3] Aristotle having said that time is number and continued, wishes to remove the apparent opposition in what has been said: for number is a discrete quantity, but that which is continued is not discrete. And, as he says, in number the least is the duad; for this is the first number and is indivisible into numbers. But in continued quantity there is not a least; for the continued is divisible into things continued, to infinity. If, therefore, there is a least number, but there is not a least time, since time is continued, time will not be number. In solving this doubt, therefore, he uses what he had before said, that time is number, not as numbering, but as numbered. But number is twofold, the one being simply and properly so; and this is that by which we numerate, is definite, and is composed from indivisible monads, and on this account contains that which is least; but the other division of number is as that which is numbered, and which is not simply, nor properly called number, and subsists in continued quantities. This, however, when it is also assumed as number, as for instance, two lines, or two years, has that which is least; but this is no longer the case when it is assumed as magnitude: for these have quantity according to magnitude, and not only according to number.

any[4] number with which we numerate swift and slow. The same time also is every where at once; but prior and posterior are not the same; because with respect to mutation, the present indeed is one, but the past and future are different. But time is number, not that with which we numerate, but that which is numbered. And this happens according to prior and posterior to be always different; for the instants are different. The number is also one and the same of a hundred horses, and a hundred men; but the things to which the number belongs are different, viz. the horses and the men[5]. Further still, as it happens that motion is one and the same, again and again, so also it happens with respect to time: as for instance, the year, the spring, or the [6] autumn. We not only, however, measure motion by time, but time by motion, because they are bounded by each other; for time bounds motion, since it is the number of it; and motion bounds time. And we say, that time is much or few, measuring it by motion, in the same manner as we measure number by that which is numerable; as for instance, by one horse the number of horses; for by number we know the multitude of the horses; and again, by one horse we know the number of the horses. The like also happens in time and motion; for by time we measure motion, and by motion time. And this happens reasonably; for motion is consequent to magnitude, and time to motion; because these are quantities, and are continuous, and divisible: for because the magnitude is such, the motion suffers these things; and time, because of the motion. And we measure magnitude by motion, and motion by magnitude: for we say that the way is long, if the journey is long; and that this is long, if the way is long. We also say that the time is long, if the motion is much; and that the motion is much, if the time is long.

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[4] If number which numerates were swift and slow, the things *numbered* would also possess from it the swift and slow: but number which numerates is not swift and slow, and therefore neither is time, since time is that which is *numbered* of motion according to prior and posterior.

[5] One of the particulars which have been before observed concerning time is this, that the present time, and which is beheld according to the now, is every where at once the same, but beheld according to the prior and posterior is not the same. Aristotle now shows that the same things may be asserted of motion in which time has its being: for the present motion is the same; since there is no difference in this with respect to itself, but it is one according to the common form of the extension of its being; nevertheless the past and the future are different from each other. As therefore one motion has same and different, so likewise has all time, which at once measures all motions: for time is not the number of this or that motion, so far as they are *such* motions, but it is the number of motion so far as motion. Hence time is one, though there are many motions, because it is the number of them, not so far as they are many, but so far as all of them are motions. But every present mutation is one, so far as it is mutation. Time, however, is not only one in species, but also in number, because it is of one species of motion, and according to number, and does not vindicate to itself the diversities of motion. But the former time is different from the latter, because motion, though it is assumed as one in number, yet, through having its subsistence in becoming to be, it is varied by prior and posterior.

Afterwards, Aristotle shows why prior and posterior time are not the same: for number, by which we numerate, is always the same, whether it be assumed as prior or posterior: as for instance the triad. It is not, however, necessary that the things numbered should be any longer the same; for horses are different from men. If therefore time is number, as that which is numbered in motion, and not as that which numerates, but that which is numbered of motion does not remain the same, it follows that the prior is different from the posterior time, and the past from the future; for the *nows* by which it is numbered and distinguished are different: for that which is numbered of motion according to prior and posterior is different. And it is evident that prior and posterior are different in definition, but in their subject as in species the same: for this has been already demonstrated.

Since, however, time is the measure of motion and of being moved; and it measures motion by giving a definite extent to a certain motion which measures the whole; (just as a yard measures length by giving a definite extent to a certain magnitude which measures the whole;) this being the case, for motion to be in time, is nothing else than for time to measure it and its essence: for at the same time it measures motion and the essence of motion. And this it is for motion to be in time, viz. for time to measure its essence. But it is evident that this it is also for other things to be in time, viz. for their essence to be measured by[7] time: for, to have a subsistence in time, is one of two things; one of which is, then to be when time is; and the other, just as we say, that certain things are in number. And this signifies, either as a part and

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[6] Aristotle having said that all present motion is the same, according to its possession of that which is common, and on this account that the same present time is also every where at once, but that the past and future are different, and times are different, now shows how prior and posterior, both in motion and time, may be the same, by existing again and again. Having also before observed, that the now is the same in subject, but different in definition, now distinctly shows how he then said it was the same; and that it is the same, just as motion is, by existing again and again; that is, while remaining the same according to species, it is generated again and again; for since motions are generated again and again, as the motion of the sun from the same, and from Aries to Libra again and again, and time is consequent to motion, it is evident that this will also be the case with the year, the spring, and autumn.

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[7] Aristotle having shown what time is, and that the properties which are said to belong to it accord with its definition, and also that we assert things to be properly in time, which are comprehended by time, now indicates what that is according to which every thing is said to be in time. His explanation, however, on account of its length, possesses a certain obscurity. But through motion, as a medium, he infers that to all things a subsistence in time is this, to have their being measured by time. And this very properly, for the existence of every thing is the energy and motion of its being. Since time, therefore, as he says, is the measure of motion, a subsistence in time, both to motion and to other things according to their motion, is for their being to be measured by time. But he shows how motion is in time, as follows: Time measures motion. But to measure motion, which does not subsist at once, but which has its being in becoming to be, is properly the same as to measure its being; that is, so far as it is motion: for motion measures, and this according to the interval in which the motion is, when we say that there is a motion of a stadium. This, however, has a measure according to accident, and not so far as motion: for, in consequence of that which is prior remaining, it has a measure of this kind; but as motion, and as having its being in becoming to be, it has for its measure time, as long as the motion continues: for this is the measure of its being which subsists in becoming to be. And we may now see that Aristotle clearly unfolds the manner in which time is the measure of motion; that it is so, according to the extension of the being of motion, according to which also it especially subsists: for in motion, as Alexander says, to be, and to be in motion, are the same; just as in other things which have their being in becoming to be. And, on this account, to measure motion is the same thing as the being of motion. Since, therefore, the essence of motion is an extended energy, for it is the entelecheia of that which may be moved, motion and the being of motion are the same. Hence Aristotle having said that time is the measure of motion, adds also, " and of being moved," not adding this as something different, but indicating that motion is energy, and that time is the measure of energy. But that motion, and the being of motion are measured by time, he shows, from every assumed motion being bounded by time: for future time is not yet, and therefore is not bounded. For as he who says that time measures the being of man, says this, that time bounds and measures as many years as man lives; in like manner, he who says that the being of motion is measured by time, says nothing else than that time measures it, so far as it is motion. In other things also, which have not their subsistence in becoming to be, but subsist wholly at once, as in man, the being of man, that is, the interval of his existence, is measured by time; but a yard, or something else of this kind, measures the man himself, that is, the interval of the man. But in motion, time measures both the being of motion and motion itself: for in motion, the being of motion, which is measured by time, and motion itself, concur.

If, however, these things are true, what will that be of motion which is measured by magnitude?

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tude? if, as has been observed, we not only measure magnitude by motion, but also motion by magnitude. It is evident that it will be the interval of motion, *which* is the same in subject with the extension of its being: for motion is energy, and is not permanent; but it is measured as a permanent interval, by magnitude, through its relation to magnitude: but as an extension of being, it is measured by time. Since, however, these are the same in subject, it is very properly said, that motion and the being of motion are the same. Having also said that time is the measure of motion, he adds, how it measures it: for every thing which is measured, appears to be measured by a certain peculiar part; since it is this part which measures the whole. This, therefore, will be the case with motion, if it is measured by motion: for a part of motion is motion; and every thing continued may be divided into equal definite parts. How, therefore, is motion said to be measured by time? Time, says he, bounds a part of motion, which part measures the whole motion; and this is bounded by the prior and posterior now. In a similar manner time measures motion, as a yard measures magnitude, not being a part of it, but by bounding a certain part of it, through which part, so often assumed, it measures the whole. Since, therefore, motion, bounded by time, as for instance that of an hour, measures the whole motion, on this account motion is said to be measured by time.

But here it may be doubted, if time is the number and measure of motion, how any thing else besides motion is measured by time and is in time, so as that it may be asserted that this to other things also is to be in time. In the second place, how will this man, and this horse, and every thing else which has not its being in becoming to be, as far as it is possible to assert this of things in generation, *i. e.* of any thing which is an object of sense, be in time, if time has its being in becoming to be, and it is necessary that what is said to be in time should be co-extended with time? In answer to the first doubt it may be said, that motion is indeed energy, and has its being in becoming to be; that the being of motion is precedaneously in time, and is measured by time; but that other things which are said to be in time, such as man or horse, according to their essential motion, which signifies the existence of essence in energy, and an energy neither perfect nor stable, but having its being in becoming to be,—that these, according to this, are in time, being composed from generation and corruption. Other things, therefore, besides motion receiving their essences, in time, Aristotle says, that these also, according to their motion, which is an extension of being, are in time. Hence things which are properly beings and which have not their being in becoming to be, and which both Plato and Aristotle call *perpetual*,—these are not in time, but in eternity, which abides in one. And if this be true, the second doubt also is solved: for generated essences are called temporal according to the flux and extension of their proper being. And thus time is a measure, of a flux and extension according to being. Simplicius adds, and thus, as it appears to me, are the philosophical discussions of Aristotle, intellectually and accurately delivered, concerning time.

property of number, and, in short, that it is something belonging to number; or that it is the number of it. But, since time is number, the now, the prior, and things of this kind, are so in time, as the monad, the even and the odd, are in number; (for these are something belonging to number, and those are something belonging to time, but things are in time as in number). If this then is the case, things are comprehended by number, in the same manner as things in place are comprehended by place. It is also evident that to be in time is not then to be *when* time is, as neither to be in motion, nor to be in place, is then to be when motion and place are; for if a subsistence in any thing were of this kind, all things would be in any thing whatever, and heaven would be in a grain of millet: for where a grain of millet is, the heaven also is; but this is an accidental circumstance. That, however, necessarily follows, viz. that to a thing which is in time, there is a certain time *when* that thing is; and that to a thing in motion there is *then* motion. But since that which is in time, is as in number, a certain time may be assumed greater than every thing which is in time. Hence it is necessary that all things which are in time, should be comprehended by time, just as other things which are comprehended in any thing; as for instance, that which is in place, by place[8]. Hence, that which is in time, will suffer something

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[8] Aristotle having observed that motion is said to be in time, as being measured by time, in the next place enumerates the significations of a subsistence in time, in order that it may become evident how temporal things, such as the now, the prior and the posterior, and the like, and also how other things are in time: for a subsistence in time signifies two things; one, then to be when time is, but the other, as when we say a thing is in number. And this is twofold: for it is either in number, because it is a part or a property of number, as two is a part, and the odd a property; or, because there is a number of such things, and they are numbered, as ten horses and ten oxen in number. Since, therefore, time is number, as is the subsistence of things in number, such also is the subsistence of things in time. Hence, the *now* and *the prior*, so subsist in time as *the monad*, and the *odd*, in monadic number: for the latter are the parts or accidents of number, but the former of time. But motion and other things, which are not parts or passive qualities of time, subsist in time, in the same manner as ten men subsist in number, through being numerated by it. As, therefore, of things which are thus said to be in number, there is always a greater

thing from time, just as we are accustomed to say, that time consumes, that all things grow old from time, and are forgotten through time: but nothing

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greater number, so of things which are in time, there is always a greater time: for time is a certain number, but if this be the case, things in time are comprehended by time, and things in place are comprehended by place. And here we may see how Aristotle understood the agreement of time with place and number prior to the things which afterwards unfold it. But this is the more proper signification of a subsistence in time: for to say, that to be in time is to be when time is, is less properly said to be in time; since thus that which is immoveable may be said to be in motion, if it is when motion is. But what does this differ from saying that heaven is in a grain of millet, and, in short, every thing in every thing, and the great in the least, since when the heaven is, then also a grain of millet is. It happens, however, to many things, to subsist *together*, or at *once*, which the words *when* and *then* signify; but for one thing to be in another, is for one thing to be comprehended by another. And to these, a subsistence together is consequent; but it does not follow that, because they subsist together, on this account they are in each other: but because they are in each other, on this account they subsist together, and because both are in the same time. Things, however, which are not in time, such as eternal natures, though, when time exists they are, yet they cannot be said to subsist *together*, or *at once*, because things which subsist *at once* are in the same time; nor are the terms *when* and *then* adapted to these. But Aristotle having shown that things which are properly said to be in time, subsist as comprehended by time, in the same manner as things in number are comprehended by number, delivers a certain argument of things which are thus in time, and at the same time a cause of their being said thus to subsist: for of things which are properly in time, it is always possible to assume a greater time than that of their existence: for thus they will be comprehended by, and will be properly said to be in time, as in place and in number. Hence, says Alexander, things *perpetual* are not in time; since time does not comprehend their being. And if, indeed, he calls things eternal perpetual, as Plato does in the Timæus, when, speaking of the paradigm of the universe, he says, "The nature, therefore, of animal itself being perpetual," he speaks well; for the *eternal* is not in time, nor is comprehended by time. But if he calls the *perpetual*, that which subsists according to the whole of time, it is not true that this is not in time, if it is only supposed so to subsist as to have its being in time. But things which have their being in becoming to be, are of this kind, and which do not, like things eternal, wholly subsist at once. If, therefore, other things which are in generation, are in time according to motion, nothing hinders things which have a never-failing subsistence in becoming to be, whether they are changed according to energy, or according to quality, or according to place, from being in time. But a subsistence in time appears to be in every respect similar to a subsistence in number, because time is number: for of things in number, it is possible to assume a greater number, because every thing numbered is in a finite number; but it is possible to assume a number greater than every finite number, because number may be increased to infinity; just as magnitude may be infinitely diminished.

nothing learns, nor becomes young, nor beautiful, through time: for time is of itself *rather* the cause of corruption, because it is the number of motion, and motion removes that which exists from its state or [8] condition. So that it is evident that eternal beings, so far as they are

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diminished. Of things in place, however, it is not always possible to assume a greater place; for if place is the boundary of that which comprehends, or the apt position * of things which are separated, place will be co-circumscribed by place. But if place is an interval, partial bodies, indeed, which are in place, will always have a certain place surpassing them, into which also they will frequently be transferred; but the whole will no longer have a greater place; for the whole receives the whole. Hence, according to every signification of place, it may be truly said that it is not possible to assume a place greater than every place, as it is of every time, and of every number. But Aristotle uses the example of place merely to show, that things in time are comprehended by time, in the same manner as things in place are comprehended by place.

[8] Aristotle having shown that whatever is in time, is comprehended by time, and is so comprehended as that there is time prior and posterior to it, in the next place adds, that things which are in time suffer from time: for we are accustomed to say, that time consumes, that all things grow old from time, and are forgotten through time, which things are corruptive of essence, life, and knowledge: for we do not, in like manner, say, that we learn, or become young, or beautiful through time, because time appears to be rather the cause of corruption, since it is the number of motion; but motion is a departure and mutation of being from its state or condition. Hence, time being something belonging to motion, removes that which exists in it from its condition, and causes it to be changed, since it is the number of the mutation and egression of every being which it contains. But Aristotle, when he says, that time is the cause of corruption, with very proper caution adds the word *rather*: for it is evident that time appeared not only the cause of corruption, but also of generation and unfolding to him who said, "long and innumerable time brings to light things immanifest, and conceals things manifest." It is likewise, not only the cause of oblivion, but of learning: for the same person says, "time causes me to know." But Simonides describes that which is wisest, by time: "for by this," says he, "all men discover and learn." And Evenus, from both these circumstances, makes time to be the wisest and the most ignorant of all things. Aristotle himself also, says in the third book, that there is a twofold motion, one from form to privation, the other from privation to form. Hence, time not only causes an egression from form, but also from privation. But it is on this account rather the cause of corruption, because generated natures always appear to be generated in time, but not by time, because the efficient cause, as for instance the builder of a house, is different from time. Corruptible natures, however, not only appear to be corrupted in time, but also by time; since nothing else is seen to be the cause of the corruption of the house. In like manner, a preceptor is the cause of learning, but time appears to be sufficient to oblivion.

* See the additional notes concerning place, at the end of the Physics.

eternal, are not in time: for they are not comprehended by time, nor is their being measured by time. As a token of the truth of this, they do not suffer any thing by, as not being in time[9]. But since time is the measure of motion, it is also the measure of rest according to accident: for all rest is in time: for it does not follow, that as that which is in motion, must necessarily be moved, so also that which is in time; since time is not motion, but the number of motion. But in the number of motion, there may also be that which is at rest: for not every thing immoveable is at rest; but that is at rest which is deprived of motion, when it is naturally adapted to be moved, as we have before observed. But to be in number, is nothing else than to be some number of a thing, and to have its being measured by the number in which it is. So that if a thing is in time, its essence is measured by time. But time measures both that which is in motion, and that which is at rest, so far as the former is in motion, and the latter at rest; for it measures the quantity of their motion and rest. So that what is in motion, will not simply be measured by time, so far as it is a certain quantity, but so far as its motion is so much[1]. Hence, such things

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[9] Aristotle now, as a certain corollary from what has been above said concerning time, collects that eternal beings, so far as they are eternal beings, are not in time: for they are neither comprehended by time, so as that a longer time of their being may be assumed, nor do they suffer any thing from time. What then shall we say of perpetual motion? for a circular motion will be demonstrated by Aristotle to be perpetual. Is this, therefore, in time or not? for if it is not in time, time is not the number of every motion. But if it is in time, how is that in time which time does not transcend? To this we reply, that because there is always another and another motion, and never the same according to number, on this account, it is possible to assume a time greater than that which is assumed. With respect, however, to things which are said to be perpetual according to essence, such as always wholly subsist at once, as intelligibles, and true beings, these possess also an energy always subsisting wholly at once; and are above time, being entirely measured by eternity. But with respect to a celestial essence, it is indeed *essentially* immutable *; and if it did not sustain any change of quality, since in this case it would not have any motion, nor extension in its being, it would also be evidently above time; for time is the measure of things *becoming to be*, and not of *being*. If, however, the celestial orbs impart to each other a certain perfection, according to their different configurations, as is evidently the case in the moon, these also will be measured by time: for that which participates of generation, must necessarily possess something generable and corruptible; but it is not necessary that it should possess this *essentially*. But, by Aristotle, and his followers, who always philosophize from clear evidence, the essence of the celestial orbs is considered as unbegotten and above time, but their motions are asserted to be temporal. Perhaps, therefore, it may be better to say, that with respect to the extremes, that is, things entirely immoveable, and things perfectly mutable, eternity is the measure of the former, and time of the latter; but that of middle natures, such as soul, and perpetual bodies, there are certain other middle measures, which are without a name.

* See the treatise On the Heavens, in which this is demonstrated.

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[1] Aristotle having thus far said time is the measure of motion, very properly adds, that it is also the measure of rest: for if rest is a privation of motion, but the same things are the criterions and measures of habits and privations, as the sight of light and darkness, the hearing of sound and silence, and a rule of the straight and crooked,—if this be the case, that which measures motion, will also measure rest, which is the privation of it; but this according to accident; for time measures motion essentially; since its essence consists in this; but it measures rest according to accident, and according to the relation of rest to motion. But since all rest is between two motions which time measures essentially, and the one *now* is indeed prior, being the boundary of the former motion, but the latter posterior, being the beginning of the second motion, the interval between these will be time, and will be accidentally the measure of the intermediate rest; because there happens to be rest between the two motions. Since, however, time is essentialized in being the number and measure of motion, how does it measure rest which is the privation of motion? For rest will be motion, if that which is measured by time is motion. Aristotle, therefore, solving this objection says, it is not necessary that what is in time should be moved: for time is not motion, but the number of motion, and a certain accident. But it does not follow that if a thing is in an accident, it will also be in the subject of the accident: for if a thing is in day, it will not also be in the motion of the sun; since day is so much time which is the number of so much motion of the sun. Hence, it is not necessary that rest should be moved, though it is not hindered from existing in time which is the number of motion: for we say, that he who is diseased has rested in so much time. A rule also which is a criterion essentially of straight lines, is likewise a criterion of such as are crooked.

But Aristotle having said that a thing which is at rest is in time, informs us also what that is which is at rest, and that it is not every thing immoveable: for if this were the case, time would not be the measure of all rest, since it is not the measure of eternal immobility, because it does not comprehend the being of it. But things at rest are, as has been before observed, such as being naturally adapted to be moved, are deprived of motion; and that which is naturally adapted to be moved, has not a perpetual immobility. In the next place he shows what it is to be in time; that as to be in number is to be some number of a thing, and to have its being measured by the number in which it is, so for a thing to be in time, is to have its being measured by time. To which also he adds, that time measures that which is at rest, so far as it is at rest, just as it measures that which is moved, so far as it is moved. It does not, however, measure the subject, but the motion and rest of the subject. But it must here be observed, that as the being things as are neither in motion, nor at rest, are not in time: since to be in time, is to be measured by time; and time is the measure of motion and rest[2]. It is evident, therefore, that neither is every thing which is not, in time; as for instance, such things as cannot subsist otherwise, as that the diameter of a square should be commensurate with its side: for in short, if time is essentially the measure of motion, but of other things according to accident, it is evident that the essence of all such things as time measures, consists in being at rest, or in motion.

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being of every thing in generation is the flux of its existence, so likewise the being of rest is in a flux and extension. Hence, though Aristotle, at first, says that rest is measured by time according to accident, yet he afterwards adds, that time measures that which is moved, and that which is at rest, so far as the former is moved, and the latter is at rest; for a certain quantity, that is the extension of each, measures the motion and rest of these, according to their being, that is, their generation and flux. Perhaps too, he says that rest is measured by time according to accident, because it is not measured by it as rest simply, but according to its generated being, just as motion and other forms become temporal through this, or, in other words, through subsisting in becoming to be; except that since in motion, motion and the being of motion are the same, time appears to subsist essentially with motion. But that Aristotle calls rest a privation of motion, not as the crooked is of the straight, nor in short, as things contrary to, are of things according to nature, but as the absence, and this according to nature, of natural adaptation, is evident, from his defining nature to be not only the principle and cause of motion, but also essentially of rest; for nature is the cause of rest. On this account too, perhaps he does not call it *permanency;* for things which always remain immoveable, as the poles and the axis of the universe, are said to be *permanent*, but not to be *at rest;* because to be at rest belongs to things which are sometimes moved.

[2] Since some things are immoveable, others are always in motion, and others are sometimes in motion and sometimes at rest, it is evident that things entirely immoveable are not in time. But things which always, and those which sometimes are in motion and at rest, are in time; and such as are neither perpetually nor sometimes in motion, these are not in time. But how is time the measure of motion and rest? For those who say that it is essentially the measure of motion, but of rest as the privation of motion, very properly say that it is alone the measure of these. But those who assert time to be the measure of motion alone, but of rest according to its being, and so far as it is beheld in a flux, evidently say that time is not only the measure of rest, but likewise of every thing else which has a subsistence in becoming to be; just as Aristotle himself says, that time is a measure according to the *being* of things: for *time is properly the measure of motion according to the flux of being*, which is the peculiarity of *generation*, or *becoming to be.* Perhaps, however, since all things in generation, are either in motion, or at rest, it is true to assert that these only are in time.

Whatever, therefore, is corrupted and generated, and, in short, at one time is, and another time is not, is necessarily in time; for, there is a certain greater time which exceeds their essence, and the time that measures their essence. But of things which are not, such as time comprehends, partly have been, as Homer once was; and partly will be, as is the case with any thing future. These time comprehends on both sides; and, if on both sides, they were and will be. But such things as time does not at all comprehend, these neither were, nor are, nor will be;—and of this kind are those non-beings, the opposites of which always are. Thus, that the diameter of a square is incommensurable with its side, always is, and this will not be in time; neither, therefore, will it be in time, for it to be commensurable. Hence, it always is not, because it is contrary to that which always is. But those things the contrary to which is not always, these may both be and not be, and of these there is generation and corruption[3]."

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[3] Aristotle still continues to unfold what things are in time, and what are not; and he now shows that neither perfect non-beings are in time, nor things which have a perpetual subsistence, nor, in short, things which time does not exceed as to duration, but those alone of which there is generation and corruption; and through this he makes his conception about time more clear. But he says that neither are all non-beings in time, but only some: for of non-beings some are past, as for instance, Homer the poet, but others remain, as an eclipse, and others are both past and remain, as war and an eclipse; and these are shown to be entirely in time. But there are certain non-beings which are incapable of being; as for instance, it is wholly impossible that the diameter of a square should be commensurable with its side. These, therefore, are not in time; and he adds the cause: for since time alone measures motion and rest, it is evident that those things of which it measures the being, must have their existence in the being moved or at rest. But these are generable and corruptible natures, and, in short, such as exist at one time, and not at another; and, on this account, they are comprehended by time: for there is a certain time which surpasses the time that measures their essence. Of non-beings, therefore, such as are of that kind, as that they have been, or will be once, or both have been and will be, the time of the non-being of these, time surpasses: for that in which they were or will be is time: and hence non-beings of this kind will be in time.

In short, the non being of those things is not in time, of which the existence is impossible; and what these are Aristotle first teaches by an example, as for the diameter of a square to be commensurate with its side, and afterwards delivers to us through an universal rule: for it is impossible for those things to be, of which the opposites are perpetual. Since, therefore, the diameter

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CHAPTER XVIII.

The next, and which is also the last of the most important dogmas contained in the Physical Auscultation of Aristotle, is, the doctrine concerning the perpetuity of natural motion. This the Stagirite discusses most elaborately and profoundly in the Eighth Book of that work, demonstrating that the first natural motion is perpetual, and splendidly announcing the perpetuity of the world, through perpetuity of motion. In this book likewise, he suspends the whole of the physical theory from the first philosophy, or metaphysics, and demonstrates that every natural essence is suspended from a supernatural cause. For he proves, that every natural body is moved: that every thing which is moved is moved by something; and that the primary mover, and which is properly so called, is an immoveable essence, possessing an invariable sameness of subsistence.

The following is that part of the Eighth Book of his Physics which contains a demonstration of the perpetuity of time, to which I have subjoined the commentary of Simplicius.

" Whether however was motion once generated, not having a subsistence before, and will it again perish, so that nothing will be moved? or was it neither generated nor will be corrupted, but always was and always will be, and is this present with things as something immortal and unceasing, being as it were a certain life to all things which have

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meter of a square is perpetually and necessarily incommensurable to the side, it is impossible for it to be commensurable. Again, what those things are which are able both to be and not to be, Aristotle delivers to us a rule, when he says, " they are those things the contrary to which is not always," and therefore sometimes is: for if their contraries always were, these would never at any time be. And if the contraries to these never were, these would be always. But if the contraries to these, at one time are and at another time are not, these also at one time existing, and at another not, will be generable and corruptible natures: for when their contraries are, these are not, and when they are not these are.

a natural[4] subsistence? That motion therefore is, all those assert who say any thing concerning nature, because they fabricate the world; and all these speculate concerning generation and corruption, which could not subsist unless motion had a being[5]. Those too, who assert that there are infinite worlds, and that some of these worlds are generated, and others corrupted, these say that motion always is; for it is necessary that the generations and corruptions of them should be accompanied with motion. But such as assert that there is one world, or that it is not always, these admit concerning motion what is conformable to that opinion[6]. If therefore it be possible, that once nothing

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[4] It is evident that Aristotle does not here investigate concerning any one of sublunary motions, for each of these has a beginning and end. Nor does he now enquire whether there is one continued perpetual motion, which afterwards he discovers. But he universally investigates whether there was a time, when there was not any motion whatever, and when, in short, nothing was moved? or whether there will be a time when nothing will be moved? or whether these things are not indeed impossible, but motion always was, and always will be, so as to be present to beings as something immortal and unceasing? For motion does not rank among the number of things which subsist by themselves, but among those which belong to other things, that is to essences. Hence, he says, "motion is present with things." But the words, "being as it were a certain life to all things which have a natural subsistence," are delivered with Aristotle's usual accuracy, in conformity to Plato. For we say that those things live, which are inwardly moved from themselves. If, therefore, all natural things have in themselves a principle of motion, that is, nature, these also may be properly said to live, according to their inward aptitude to motion. For nature is the last of animals. Hence, it has its being in a subject natural body; and is rather, as it were, something living, than properly life; and the motion according to it, is an aptitude to motion, as we shall learn in this book.

But that Aristotle says agreeably to Plato, that inward natural motion is, as it were, a certain life, is evident from the following passage from the Tenth Book of Plato's Laws—"If we should see this (inward motion) subsisting in that which is earthly or aquatic, or fiery, either separate, or co-mingled, what should we denominate the passion in a thing of this kind? Do you ask me if we should say that a thing lives, when itself moves itself?" These things, however, are said concerning the self-motion properly so called, viz. the psychical, or belonging to soul. Hence Aristotle very properly says, that natural motion is as it were a certain life, and does not call it simply life, because soul is to nature, as life, properly so called, is to natural motion.

[5] Aristotle says, that natural philosophers fabricate the world, not as if asserting that the world was generated in time, but as unfolding the composition of it through motion. For thus Democritus, Empedocles, and Anaxagoras, fabricate the world; the two former asserting that atomic bodies and the four elements compose the world by their mixture and separation; but Anaxagoras contending that the *homoiomeræ*, or *things of similar parts*, were separated from the mixture. The mingling also, the separation, and the secretion, are certain motions. And all of them indeed speak concerning generation and corruption, which are not produced without motion; for local motions, alliations, augmentations, and diminutions, precede generations and corruptions.

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[6] Those who asserted that there are worlds infinite in multitude, as Anaximander, Leucippus, and Democritus, and afterwards Epicurus, said that they are generated and corrupted infinitely, some of them always rising into being, and others always perishing. They also said that motion is perpetual; since without motion, there is neither generation nor corruption. But of those who said there is only one world, some asserting that it is unbegotten in time and incorruptible, admitted that motion also is perpetual, as Plato and Aristotle. And those made the one world to be generable and corruptible, who assert indeed that the world always is, yet not always the same world, but that at a different time a different world is generated, according to certain temporal periods, as Anaximenes, Heraclitus, and Diogenes, and afterwards the Stoics. And it is evident that these also had the same opinion concerning motion; for when the world was, then also it is necessary that there should be motion. With respect to Empedocles indeed, if any one understands his words literally, when he sometimes calls the universe a sphere, and sometimes the world, it is evident that by surveying motion in the generation of the world, he supposes it to be always rising into being, and perishing: for he is of opinion, that the sphere and the world always are, and that motion is always in the world. But Anaxagoras, Archelaus, and Metrodorus Chius, appear to say, that the world was generated from a temporal beginning: and they also say that motion had a beginning. For things being at rest prior to the existence of time, they say that motion was generated by intellect, by which also the world was produced. These, however, appear, for the sake of doctrinal order, to have supposed a beginning of the fabrication of the world. And Anaxagoras clearly says, that intellect gave subsistence to the mundane separation from intelligible union, in which, as he says, all things subsisted together.

Alexander, however, says, that Plato asserts the world to have been produced in time, except that prior to the generation of the world, he says, there was a confused and disordered motion in things. That Plato, however, does not say that the world was generated from a temporal beginning, in such a manner as if time had a prior subsistence, is evident from his clearly saying, that time was generated together with the universe; so that neither must a confused and disordered motion be conceived to have subsisted according to Plato prior to the universe in time; but in order that he might indicate the disorder and confusion of a generated nature, subsisting according to its falling off from real being, and the order from the demiurgus, which always adorns it, he exhibits each of these in his discourse apart from one another.

Such then being the division of the opinions about the world, those who say that there are infinite worlds, so that while some are always rising into being, others are always perishing, assert that motion is perpetual; but those who say, that there is always one world, and that the same, or one world indeed, but not always the same, these also speak concerning motion, in a manner adapted to their opinion about the world. For those who say that there is always one and the same nothing was moved, it is necessary that this must have happened in a twofold respect; for it must either be as Anaxagoras says, viz. that all things subsisting together, and being at rest in an infinite time, intellect produced, and separated, motion: or, as Empedocles says, that things were alternately moved and at rest; being moved indeed, when friendship made one from many things, or strife many from one; and at rest in the intervening times. For he says as follows:

As far as one from many was produc'd,
Or many to the one their being ow'd,
So far these natures generated were,
Nor firm eternity in them abides.
But so far as for ever they are chang'd,
Nor cease at once t' exist, for ever they
Immoveable, alternately remain.

For by the words, "so far as they are changed," we must conceive that he means hither and thither[7]. With respect to these things therefore, we

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same world, likewise say that motion is perpetual. In like manner those who say that at different times there is a different world, when the corruption of one is followed by the generation of another, these also say, that motion is perpetual; for the world always existing, it is necessary that motion should always exist.

[7] If it be possible that there was a time when nothing was moved, it must necessarily either be so as that motion was not before, as Anaxagoras seems to say, rendering more clear the perpetually consubsistent procession of secondary from primary natures, by an apparently temporal evolution. And there is the same mode of hypothesis, though some one should suppose motion not to exist hereafter; on which account, this is not mentioned by Aristotle. But Anaxagoras appears to say, that all things subsisting together, and being at rest in an infinite past time, intellect the fabricator of the world being willing to separate the forms of things, which he calls *homoiomeræ*, inserted in them motion; since corporeal separation could not be effected without motion. But the second mode is that of Empedocles, alternately making motion and rest; for according to him the intelligible and sensible worlds are composed from the same four elements, viz. the former paradigmatically, and the latter iconically, or after the manner of an image. The producing cause also of the intelligible world, is according to him *friendship*, which through union forms it into a sphere, and which also he denominates God; but the producing cause of the sensible world through separation is *strife*. In this world, however, both union and separation may be seen, both of them indeed always, but one of these having dominion over the other, in different

we must consider how they subsist: for to perceive the truth respecting them, not only contributes to the contemplation concerning nature, but also to the method which pertains to the first principle[8]. But we shall first begin from things which have been before defined by us in the Physics. We say, therefore, that motion is the perfect energy of that which is moveable, so far as it is moveable. Hence it is necessary that things should be present which are capable of being moved according to each motion. And without the definition of motion every one must acknowledge it to be necessary, that what is able to be moved, should be

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different parts, or at different times. For Empedocles says, that here also *friendship* and *strife* alternately have dominion, in men and fishes, in beasts and birds.

But Aristotle, citing those verses of Empedocles in which he conceives him to have delivered motion and immobility, surveys motion according to generation; Empedocles clearly asserting, that the one is produced from the many, and the many from the one, and that so far as this is the case, they are generated, and do not possess stable eternity; for that motion subsists with generation, has been before observed. But Empedocles appears to have surveyed immobility according to the perpetual sameness of the mutation of the one and the many into each other; for this is the meaning of the following lines:

> But so far as for ever they are chang'd,
> Nor cease at once t' exist, for ever they
> Immoveable, alternately remain.

For so far as they perpetually change into each other, their mutation and motion are perpetual; but so far as changing hither and thither sensibles are generated, as, for instance, one from the many, or many from the one, and after the mutation they stop, sometimes so as to be one, and at other times so as to be many: so far as this is the case, always periodically returning after the mutation to the form of the one or the many, according to this period they are immoveable, until they again begin to change.

[8] Aristotle here shows how the investigation of the perpetuity of motion is necessary. And in the first place it contributes to the physical theory. For if natural motion is perpetual, whether according to the continued, or according to never-failing mutation, it is evident, that natural things also are perpetual; some of them, indeed, through remaining the same in number, but others through the corruption of one being the generation of another. In the next place it contributes to the ascent to the first principle, the contemplation of which no longer pertains to physics, but to the first philosophy. But it contributes to this ascent, because it will be shown that perpetual motion subsists from an immoveable cause, who is entirely exempt from a natural essence.

be moved according to each motion; as for instance, that what is capable of being changed in quality, should be changed in quality, and that what can be locally changed, should be borne along. Hence it is necessary that what is capable of being burnt, should be prior to that which is burnt; and that which has the power of burning, to that which burns[9]. It is necessary, therefore, either that these should have been once generated, there being a time when they were not, or that they should be perpetual. If, however, each of those things which can move and be moved, is generated, it is necessary that another mutation and motion should be generated prior to the mutation which is assumed; according to which that is generated, which is able to be moved, or to move. But if they always had a prior subsistence, motion not existing; an absurdity will immediately appear to the intelligent. And to those who proceed still further, this will be found to happen by a yet greater necessity. For if, since some things are moveable, and others motive, there is at any time something which first moves, and something which is first moved; and if at another time there is nothing which moves, but it is at rest, it is necessary that this should have been previously changed: for there was some cause of its rest, since rest is a privation of motion. So that there will be a mutation prior to the first mutation; for some things move according to one motion, but others according to contrary motions. Thus fire heats indeed, but does not refrigerate;

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[9] Aristotle, beginning to demonstrate the perpetuity of motion through many arguments, produces the first from the definition of motion, which he says he had before given in his Physics; calling the first five books of this work Physics, which also he frequently denominates, Concerning Principles. In the Third Book, therefore, he gives the definition of motion, which he now mentions; that it is the energy of that which is moveable, so far as it is movable; viz. that which is moved remaining in capacity, as long as it is moved; for when it perfectly abandons a subsistence in capacity, and becomes in energy according to that with respect to which it is said to be in capacity, it is no longer moved, but stands still in energy. But it is always moved, so far as it has something in capacity, which proceeds to a subsistence in energy. From this conception of motion, Aristotle demonstrates, that motion is perpetual, not only that which is properly so called, but also the mutation under which generation and corruption subsist.

It must here, however, be observed, that it is true only of changeable motion, that what is naturally adapted to be moved, should necessarily subsist prior to motion, whether it is passively or actively moved.

but science appears to be one of things contrary. Hence there also something similar appears: for the cold heats being turned in a certain respect, and having departed; just as he who possesses scientific knowledge, willingly errs, when he improperly uses science. Such things, however, as are able to act and suffer, or to move and to be moved, are not entirely able to effect this, but then only, when they subsist in this manner, and are near to each other. Hence, when they approach near, the one moves, and the other is moved; and when they are so circumstanced, that the one is motive, and the other moveable. If, therefore, it was not always moved, it is evident that they were not so affected, as that the one could be moved, and the other could move; but it was necessary that one of them should be changed. For it is necessary that this should happen in things which have a relative subsistence. Thus, if a thing not having been double is now double, if not both, at least one of them must have been changed. There will therefore be a certain mutation prior to the first[1]. To which may be added, how will there be prior and posterior time not having a subsistence; or how will there be time motion not existing? But if time is the number of motion, or a certain motion; if time always is, it is necessary that motion also should be perpetual. Concerning time, however, all philosophers, except one, appear to accord, for they say that it is unbegotten. On this account Democritus shows, that it is impossible for all things to have been generated; because time is unbegotten[2]. But Plato alone generates time; for he says, that it was generated together with the universe, and that the universe is generated[3]. If, therefore, it is impossible

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[1] Aristotle having shown, that though the mover and thing moved should be supposed to be generable, and though they should be supposed to be perpetual, if to move and to be moved are assumed from a beginning of time, it is necessary prior to the supposed beginning of motion, that another motion should be assumed, so that there will always be a mutation prior to that which appears to be the first. Hence motion is demonstrated to be perpetual, from not being able to assume a first motion. Having especially shown these things from that which is moved, he afterwards shows the same thing from that which moves. For that which is motive in capacity of any thing, if it is also about to move in energy, must necessarily itself first change, the moveable subject subsisting unchanged. And this indeed is immediately manifest. But he also demonstrates this according to another method. For previously assuming in capacity, that things which move with contrary motions, according to nature, the things moved remaining the same, must necessarily move with contrary motions, themselves being changed, afterwards, he assumes from division, that of things motive, some move with one simple motion, as fire heats, and snow refrigerates; but others move with contrary motions; as science moves the soul both to truth and falsehood, when he who possesses scientific knowledge willingly errs. Aristotle also observes that things which appear to move in one way only, produce contrary dispositions; as that which is cold heats according to accident, by departing. Thus also, that which moves according to place, rests by *departing*, that is, *by becoming disposed in a different way*. So that all motive natures are not always able to move, nor are always able to be at rest; but they are then able, when if it should so happen they approach near to moving, and depart from being at rest. Hence,

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Hence, when they are so circumstanced, that the one does not move, and the other is not moved, but afterwards the one moves, and the other is moved, a mutation is evidently produced, either about both, or about one of them; for all relatives thus pass from a subsistence in capacity, to a subsistence in energy, either one or both of them being changed. But that which moves, and that which is moved, are relatives. Hence, again concluding the argument, he very properly adds, there will be, therefore, a certain mutation prior to the first. And again, the same questions must be asked concerning this mutation which is produced by that which moves, in order that it may be able to move in energy. For why again does it now move with that motion, and not before?

[2] All the philosophers, says Aristotle, except Plato, conceived time to be perpetual; for he says, that it was generated together with the world. We shall shortly, however, learn how this is asserted by Plato. But Democritus believed time to be perpetual, because wishing to show that not all things are generated, he employed for this purpose, as a thing evident, that time is not begotten. Anaxagoras, also, when he says, "all things *were* together," indicates that there was time prior to the fabrication of the world; for the verb *were* is temporal. He likewise says, that things being indistinct in an infinite past time, they were afterwards separated and adorned by intellect. Empedocles, also, when he says, that there is perpetually an alternate dominion at one time of friendship, and at another of strife, evidently conceives time to be perpetual. But if time, motion also is perpetual.

[3] That which is generated, and that which is without generation, being multifariously predicated, Plato using them in one way, and Aristotle in another, they appear to oppose, though in reality they do not dissent from each other; for that is said to be generated, which formerly was not, and afterwards is, and which has its subsistence in a part of time; according to which signification Aristotle uses the term *generated*, dividing it in opposition to that which is perpetual. But there is another signification of that which is generated, according to which it is divided in opposition to *true being;* for having its being *in becoming to be*, it subsists from another cause, and not from itself. Hence, through both these; viz. through its opposition to true being, the whole of which subsists at once, and to that which is self-subsistent, it is said to be generated, though

possible for time to be, and to be conceived without *the now*, but *the now* is a certain middle, possessing at the same time the beginning and the

though it should be perpetual, and according to this signification, Plato calls every sensible and corporeal nature generated. For every thing corporeal being divulsed, is neither able to give subsistence to itself, nor to be at once a collected whole, neither according to essence nor according to the being of essence. And it is evident, that he immediately opposes that which is generated to being, when he says in the Timæus, we must enquire what that is which is always being, but is without generation; and what that is which is generated indeed, but is never being." According to this signification of that which is generated, and not according to that used by Aristotle, Plato says, that the world and time are generated. Hence, enquiring concerning the world, whether it always was, having no beginning of generation, or whether it was generated, originating from a certain beginning, he replies, "It was generated, for it is visible and tangible, and has a body; but all such things are sensible, and sensibles being apprehended by opinion in conjunction with sense, appear to be generated and generable." Here we may see, that Plato assigning the cause of the world being generated, does not say, that not having an existence before, it afterwards was; but that it is visible and tangible, and has a body. He was also of opinion, that time was generated; for he says, that it was generated together with the universe. Nor does he assign as the cause of this, time not existing before, but afterwards; for he says, that it is perpetual, though not in such a manner as eternity, but because it is the image of eternity, and subsists according to motion. Plato therefore in the Timæus, after the animation of a corporeal nature, says, "As soon as the generating father understood that this generated image of the perpetual gods moved and lived, he was delighted, and in consequence of this delight, considered how he might fabricate it still more similar to its paradigm. Hence, as that is an eternal animal, he endeavoured to render the universe such to the utmost of his ability. The nature indeed of the animal, its paradigm, is eternal, and this it is impossible to adapt perfectly to a generated effect. Hence he determined by a dianoëtic energy, to produce a certain moveable image of eternity: and thus while he was adorning and distributing the universe, he at the same time formed an *eternal image*, flowing according to number of eternity abiding in one, and which receives from us the appellation of time."

Here we may observe, that the demiurgus being willing that the universe, which is itself an image, should be as much as possible perpetual, imparted to it time, the image of eternity; in order, as he says, that the world might be as much as possible similar to its paradigm. "For its paradigm," says he, "is through all eternity being: but the world, through the whole of time was, and is, and will be." If therefore the world was, and is, and will be, through the whole of time, it is evidently perpetual; not indeed in the same manner as eternity; for the eternal has the whole of its essence, power and energy subsisting at once, because eternity possesses *the ever* in profound union with being. But time and that which is temporal, having their being in becoming to be, evolve the all-perfect nature of eternity and the eternal, according to motion and generation. If, therefore, Plato says, that the universe participates of perpetuity as much the end, the beginning indeed of the future time, and the end of the past; it is necessary that time should always be. For the extremity of the last time which is assumed will be in some *now;* since nothing can be assumed in time, besides *the now.* So that since *the now* is both a beginning and an end, it is necessary that time should always be, on each side of *the now.* But if time, it is evident that motion also must necessarily always exist; since time is a certain passion of motion [4]. The same

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much as possible, through time, it is evident, that time according to him is perpetual, though not in the same manner as eternity. Let no one therefore looking at the words fancy that these philosophers oppose each other. For if, indeed, adopting the same significations of that which is generated, and that which is without generation, the one said, that time and the world are generated, but the other, that they are without generation, they would speak contrary to each other; but now they accord in their conceptions. For if Aristotle calls time the number of motion, but Plato an eternal image proceeding according to number, what difference will there be in these conceptions, since they even agree in the appellations which they employ? If also Aristotle says, that time is perpetual, but Plato, that the world becomes perpetual through the participation of time; and if Plato clearly says, that the world is generated as being corporeal, but time, as having its being in motion and becoming to be, both which Aristotle also acknowledges, how can we any longer think that what is generated according to Plato, contradicts that which is without generation, according to Aristotle, in conceptions, and not in words only.

Why then, it may be said, does Aristotle say, that all philosophers except Plato assert time to be without generation? We reply, because Plato alone says, that time was generated, and adds the cause of its being generated; for it was generated together with the universe. But why does he also say that the universe was generated? Because it was usual with the ancients to contradict that which is apparent, through a contempt of the knowledge of the mere superficial. Since, therefore, the term *generated* is more usually asserted of things which formerly were not, and afterwards are, on this account Aristotle, contradicting this signification of the word, appears indeed to correct Plato who calls time generated, but in reality does not correct Plato, but those who adapt this signification of the word generated to time and the world.

[4] The demonstration of what is now said by Aristotle, is as follows: Time is and is conceived according to *the now*; for of time *the now* alone has a subsistence, because the past no longer is, and the future is not yet. But time which subsists according to *the now*, subsists according to a medium which is in the beginning of the future time, and the end of the past. And that which subsists according to such a medium, as that there is always something prior and posterior to that which is assumed, is a thing of this kind. For that which may be hypothetically adduced as the last *now*, is itself a middle, and has time posterior to itself; so that there is neither a last now, nor a last time. For if there is a last time, there is also a last *now*, if *the now* is the boundary of time, just as a point is of a line. In a similar manner, neither has time a beginning:

same reasoning likewise will prove, that motion is incorruptible. For as, if it be admitted that motion was generated, it will happen that there was a certain mutation prior to the first; so here it will happen that there is a mutation posterior to the last. For a thing will not at the same time cease to be moveable and to be moved: or to be capable of being burnt, and to be burnt (for that may be capable of being burnt, which is not burnt) nor to be motive and to move. But it will be requisite, that what is capable of being corrupted, should have been corrupted, when it is corrupted: And again afterwards, that which has the power of corrupting this. For corruption is a certain mutation If, therefore, these things are impossible, it is evident that motion is perpetual, and not sometimes in existence, and sometimes not[5]. For thus to speak rather resembles

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beginning: for *the now* which appears to be in the beginning, is itself also a middle; since as it is the beginning of the future, so it is the end of the past. Time, therefore, is perpetual, neither having a beginning nor an end. But if time always is, motion also will evidently be perpetual; since time is the number or passion of motion. And as it is not possible to assume motion without time, so neither time without motion. Such then is the exposition of the interpreters of Aristotle, of what is here said by him intellectually and divinely, in order to demonstrate that motion is perpetual.

[5] Aristotle having proposed to show that motion was not once generated, not having a prior existence, nor can be corrupted so as not to exist afterwards, uses two arguments, one from the definition of motion, and the other from that of time, exhibiting from this the object of investigation in a twofold respect; viz. from the prior and posterior, and from *the now* which always exists in the middle of the past and the future. In both the arguments, however, from time he demonstrates both these viz. that time was not when motion was not; and that time will not be, when there is no longer any motion. But in the argument derived from definition, having demonstrated that motion is unbegotten, and that time was not when motion was not, passing on to the argument derived from time, he now adds, what is wanting to the argument from definition, viz. that motion is incorruptible. For as in the former arguments he demonstrated that motion is without generation, in consequence of that which is capable of being moved always subsisting prior to motion, so here he demonstrates it to be incorruptible through that which is capable of being moved always subsisting together with motion. For this is the meaning of the words, "A thing will not at the same time cease to be moveable, and to be moved, nor to be motive and to move." For if a thing should cease to move, or to be moved, and should be immediately corrupted, the capability of being moved, will not remain after the motion. But if when not capable of being moved, it is capable of being at rest, because nature is the principle of rest as well as of motion, if any thing ceases to be moved, it will not then also cease to be moveable, when motion is assumed as

resembles a fiction than any thing else[6]; as also to assert, that it is thus naturally adapted, and that it is necessary to consider this as a principle, which Empedocles appears to have asserted, who says, that it is necessarily inherent in things, that friendship and strife should alternately govern and move, and that they should be at rest in the intermediate time. Perhaps, also, those who make one principle, as Anaxagoras, would assert the same thing. Nothing, however, among those things which consist from and according to nature, is deprived of order: for nature is to all things the cause of order. But the infinite has no ratio to the infinite; and all order is ratio. That any thing, however, should have been at rest for an infinite time, and afterwards should have been once moved; and that with respect to this there should be no difference, why it happened now rather than before, and again, that it should have no order,—this is no longer the work of nature. For that which subsists by nature either subsists simply, and not differently at different times (as fire is naturally carried upwards, and not at one time and at another not), or it has a ratio which is not simple[7]. Hence it is better to say with Empedocles,

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as that which is properly motion, and not as the corruption of that which may be moved. If, therefore, when ceasing to be moved, it remains moveable, it may evidently be again moved, and that will not be the last motion with which it ceased to be moved.

[6] Aristotle having demonstrated that motion is perpetual through the perpetuity of time, and that it is impossible to suppose motion or time to be generable or corruptible, now says, that from this also, motion and time are shown to be perpetual: since to assert that motion or time once were, and once were not, rather resembles a fiction than any thing else. For what can be more fictitious than to say, that neither motion nor time, formerly existing, were once generated? Since why they were then generated, and not before or afterwards, is more similar to a fiction. It may also perhaps be said to be fictitious to assert that there was time when there was no time. But he who says, that once there was time, and once there was no time, says this. The same fiction also takes place in motion; since time is the number of motion. For if time was when motion was not, but when motion is not, neither is there time, he who says this, evidently says nothing else, than there was time when there was no time.

[7] Aristotle having said, that to assert that motion at one time was, and at another was not, resembles a fiction, because the cause of this cannot be assigned, afterwards says, that to assert this is naturally adapted to be so, and to assign this as a principle and cause, is similarly fictitious.

This,

Empedocles, and any other who may assert the same thing, that the universe is alternately at rest and in motion: for now a thing of this

This, however, Empedocles appears to assert, when he says, it is necessarily inherent in things that friendship and strife should alternately govern: and if this be the case, that they should be at rest in the intermediate time. For rest is between contrary motions. But Eudemus considers immobility as subsisting in the dominion of friendship according to the sphere. For when all things were mingled together, Empedocles says,

Then, nor the sun's swift members splendid shone,
But in dense harmony establish'd lay
Conceal'd; eternity's revolving sphere
Rejoicing round its centre firm to roll.

But strife again beginning to have dominion, then again motion was produced in the sphere.

Then all the members of the God appear'd.

What difference is there, however, between asserting that this was naturally adapted to be the case, and saying that it was from necessity, without adding the cause? But these things Empedocles appears to assert, when he says,

By turns they govern in revolving time.

He also asserts, that necessity is the cause of generated natures;

Of Gods' necessity 's the antient seal,
For ever stamp'd with oaths of various forms.

For through necessity and these oaths, he says, strife and friendship alternately have dominion. But Empedocles speaks of the dominion of strife, as follows:

When mighty strife was in the members hid,
It to the honors rose of perfect time,
And oaths in mutual turns for them remain'd.

To assert these things without assigning a cause, is nothing else, says Aristotle, than to say, that it is naturally adapted to be so. Perhaps too, says he, Anaxagoras asserts intellect to be a similar principle of motion, the prior homoiomera being at rest, and not adding the cause through which intellect then moved; though in nature, and things produced by nature, the causeless and the disordered, are especially to be avoided.

kind possesses a certain order. He however who asserts this, ought also to assign the cause of what he says, and not adopt any axiom without a reason, nor expect that it should be granted him; but he should either employ induction or demonstration. For the things which Empedocles supposes are not causes. Nor is this the essence of friendship or strife; but it is the province of the former to conjoin, and of the latter to separate. If also it is added, that they have dominion *alternately*, it should be shown in what particulars this happens; as for instance, because there is something which unites men, viz. friendship, and enemies avoid each other. For this is also supposed to be in the universe, because it thus appears to be in certain things. His assertion likewise, that this happens in equal times, requires a certain reason. And in short, to think that this is a sufficient principle, viz. that it either always is, or is always generated, this is not right; to which Democritus refers natural causes, because they were thus, and prior to this, generated. But he does not think that the principle of eternity should be investigated in some things speaking rightly; but because he asserts this of all things, not rightly. For a triangle has always angles equal to two right, but at the same time, there is a certain other cause of this perpetuity. Of principles, however, there is no other cause, since they are eternal[8]. That there neither was, therefore, nor will be a time, a time, when motion was not, or will not be, has been thus far shown."

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[8] Aristotle says, it is not right to assume as an indemonstrable principle, that a thing is always and every where. For many things are indeed perpetual, and are so every where, yet they are not principles and things indemonstrable, but such things have certain causes and principles of their being. Thus in mathematics, that the three inward angles of a triangle are equal to two right, is indeed a thing perpetual, and this is the case in every triangle, yet it is not on this account an indemonstrable principle; but there is a certain principle of this, from which it is demonstrated. In like manner, that summer and winter alternately succeed each other, is a thing perpetual, and is so every where, yet it is not a principle, but there are principles and causes of a motion of this kind. Hence Aristotle does not admit Democritus referring natural causes to this principle, because they were formerly thus produced, and no longer thinking fit to investigate the principle and cause of things which are always generated in a similar manner; nor perceiving that in things in which the perpetual is a self-credible and indemonstrable principle, in these it is right not to investigate the cause of their always subsisting in this manner, but that in things in which

which the perpetual is not a principle, in these principles and causes must be assigned. For not every thing perpetual is a principle, though principle is entirely perpetual; since the perpetual is more extended than principle. Hence a geometrician being asked to demonstrate that the three inward angles of a triangle are equal to two right, is not satisfied with saying, that this is a perpetual thing, a principle, and indemonstrable, but he adds the demonstration. Democritus therefore must not think it a sufficient cause of the congress and connexion of the atoms, that things generated were always thus generated. It has, however, been frequently observed, that Empedocles and Anaxagoras assert, that the intelligible world is united, and the sensible world separated. But both these worlds having a perpetual subsistence, they assumed mutation according to time, for the purpose of indicating the order of these worlds, and of the generation of the sensible from the intelligible world. Empedocles also signified by this, the conversion of the sensible to the intelligible universe.

A

DISSERTATION

ON THE

PHILOSOPHY OF ARISTOTLE.

BOOK II.

CHAPTER I.

HAVING therefore presented the reader with an ample account of the principle dogmas of Aristotle's philosophy contained in his Physical Auscultation, I shall in the next place direct his attention to the most important of the doctrines contained in his treatise on the Heavens.

The first of these doctrines then is this, that a celestial body is perpetual; and in order to demonstrate this, he previously evinces that it is different from the four elements. This he shows from the multitude of natural motions. For if natural things are natural from having nature, (but nature is a principle of motion,) the demonstration from natural motion, is at the same time from things more evident, as being from energies; and at the same time is from things more peculiar, as being from causes. But in order to the demonstration from motions, he pre-assumes six things, viz. that there are two simple motions, that which is in a circle, and that which is in a right line; that a simple motion is the motion of a simple body; that of a simple body the motion is simple; that there is one natural motion of one thing; that one motion is contrary to one; and that the heavens are circularly moved. These hypotheses also are mentioned by Plotinus in his treatise On the World. For being desirous to show according to Plato, the perpetuity of the Heavens, he says, the demonstration of this will be attended with no labour to Aristotle, if his hypotheses about a fifth body are admitted, meaning the above-mentioned. For these being admitted, the perpetuity of the heavenly bodies necessarily follows.

It is requisite to observe, however, that by simple bodies, Aristotle means those which contain a principle of motion according to nature. For animals and plants have also a principle of motion, yet not according to nature, but according to soul; and hence they are differently moved at different times. For composite bodies do not remain in the possession of similar parts, but also receive organic parts; as having a soul which uses the body, as an instrument. But nature is the principle of the motion of a simple body; and hence bodies which alone possess nature, have alone a simple motion.

The following argument, employed by him to show that the heavenly bodies are not moved by violence, appears to me to possess an invincible strength. If a celestial body is moved by violence, it is not moved naturally; and if it is not moved naturally, it is moved contrary to nature. But the motion which is contrary to nature, is posterior to that which is according to nature. For that which is contrary, implies the prior existence of that which is according to nature. The body, therefore, which is moved with a violent motion, has some natural motion prior to this. Hence, if the heavenly bodies have always been moved by violence, they have always been moved contrary to nature, at the same time possessing a natural motion, which has never been exerted, but perpetually counteracted. God and nature, however, do nothing in vain.

This dogma is so very important, and so completely subverts the present

sent system of astronomy, that I thought it necessary to premise thus much concerning it in order to awaken the attention of the reader to the following more ample discussion of it by Aristotle, and his excellent commentator Simplicius.

Aristotle, therefore, begins his treatise On the Heavens as follows:

"The science concerning nature, nearly appears to be for the most part conversant with bodies and magnitudes, and the passive qualities and motions of these. It is also conversant with such principles as pertain to an essence of this kind. For of things which have a natural subsistence, some are bodies and magnitudes, others have a body and magnitude, and others are the principles of those which have [1]. That is continued,

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[1] The preface of Aristotle, says Simplicius, teaches us the intention and order of this treatise, because it immediately follows the Physical Auscultation. For as that discussed natural principles, it was necessary after it to speak of those things which consist from principles. But these are proximately bodies. And he syllogizes as follows: The science concerning nature is about things which have a natural subsistence. But things which have a natural subsistence, are either bodies, as water, stones, and wood, or things which have bodies, as plants and animals; or they are the principles of things which have bodies, as matter, form, motion, and the like. Soul also is the principle of things which have bodies, as of animals and plants. After the discussion, therefore, of natural principles, it is necessary to teach concerning bodies, and things which have bodies. And it is evident that in these there are many bodies, and that the theory about these is manifold. For the things which have bodies, and the principle of those which have them, are known from bodies, and especially from such as are natural. Hence the science concerning nature is nearly for the most part conversant with bodies and the passive qualities of bodies according to which they suffer and act. It is also conversant with the motions of them. For there are different species of motion: some according to place; others according to alliation (or change in quality) and others according to increase and diminution. But generation and corruption are now called motions: and he appears to have proceeded from passions to motions, as to that which is more universal. For passions also are certain motions; unless perhaps he calls energies motions, giving them a division opposite to passions.

Simplicius farther observes, that Aristotle says *nearly*, from philosophic caution, and that perhaps for the same reason he adds, the word *appears*. But the words conversant with bodies and magnitudes are to be considered as having the same signification, unless they are intended to show that every body has magnitude, and that there are not, as some have asserted, indivisible or impartible bodies. Or he uses these words, because the natural philosopher not only makes bodies the subject of his discussion, but also length and breadth, so far as they are the boundaries of bodies. Perhaps also, because the natural philosopher discusses time and place; for these also possess continued, therefore, which is divisible into things perpetually divisible; but body is that which is every way divisible. And of magnitude indeed, that which is divisible in one way is a line; that which is divisible in two ways is a superficies; and that which is divisible in three ways is a body. And besides these there is no other magnitude, because three are all, and thrice includes every thing. For as the Pythagoreans also say, the all and all things are bounded by three; since end, middle, and beginning contain the number of the all, and these contain the number of the triad. Hence, assuming this number from nature, as if by a law of nature, we use it in the worship of the gods. After this manner also, we assign appellations: for we call two things *both*, but not *all*; and we first give the appellation of all to three things. We speak, however, in this manner, because, as we have said, we follow nature in so doing. Hence, since all things, the all, and the perfect, do not differ in form from each other, but if they at all differ, it is in the matter, and in the things of which they are predicated, body will be the only perfect magnitude: for it is alone bounded by three things; and this is *all*. And since it is triply divisible, it is every way divisible. But of the other magnitudes, one is divisible in one way, and another in two ways. For as they partake of number, so likewise of division and continuity. Thus, one magnitude is continued according to one dimension; another according to two dimensions; and another is every way continued [2]. Such magnitudes, therefore, as are

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possess magnitude, so far as they are continued and divisible, and yet they are not bodies. In short, if it is the business of a natural philosopher to speak of the continued, but not every thing continued is a body, as Aristotle will shortly teach us, he very properly adds both, viz. *body and magnitude*.

[2] Aristotle shows, that body is every way divisible and every way continued, and endued with interval, because that which possesses a triple interval is also triply divisible; for three are all, and a threefold way is every way. But that body possessing a triple interval, has an interval every way, he shows from this, that no magnitude has more than three intervals. Hence, that which has three intervals, has an interval every way. This also is evinced by the property of the triad; for three are all, and three ways include every way. The Pythagoreans also briefly prove this, as follows: *the all*, in consequence of having a beginning, middle and end, is defined by the number of

are divisible, these also are continued. But whether all continued quantities are divisible is not yet manifest from what we have now said. This,

of the triad; and perhaps also is perfect on account of having a beginning, middle, and end. For that which is not all, is in something deficient to the being all, and is imperfect. Perhaps also the all, and the perfect, are mutually convertible; but the perfect is said to be perfect because it has an end, and that which has an end, has evidently a beginning and middle. But that three things are all, and perfect, Aristotle shows from this number being employed by the sacred religion of antiquity. And after all, he persuades us to a belief of this, viz. that three are all, and that thrice includes every thing, from the use of names. But, from what has been said, he again shows, that body alone, among magnitudes, possesses interval every way, as was before observed, and is alone perfect, assuming that the all, the whole, and the perfect, are the same, though they somewhat differ according to subject. Simplicius adds, that it deserves to be noticed, that Aristotle, contrary to his usual practice, employs in his demonstration Pythagoric persuasions. But here it may be doubted, why that which has an interval in three ways, has an interval every way, because three is a perfect number. For as a number it is perfect, having a beginning, middle, and end; but why on this account, is that which possesses a triple interval, the all, and perfect, since it may happen to be in want of other things. For no one who has three fingers, will have all fingers, because he has three; nor, because there are three elements here, are there now all the elements. May we not say, that as there are three intervals, that which has an interval in three ways, has an interval every way, because there is no other interval. Perhaps, therefore, Aristotle, in demonstrating that body possesses an interval every way, from there not being any other interval, employs arguments from the number three, according to probability.

Simplicius farther adds, that the admirable Ptolemy, in his treatise on Interval, or Dimensions, has well demonstrated that there are not more than three dimensions; because it is requisite that dimensions should be definite. But definite dimensions are assumed according to perpendicular right lines; and three right lines only can be assumed at right angles to each other; two indeed being those according to which the superficies is terminated, but the third being that which measures the depth. Hence, if there were any other interval after the third dimension, it would be perfectly unmeasured and indefinite. Aristotle, therefore, appears to assume from induction, that there is not a transition into another magnitude, but this Ptolemy demonstrates.

I shall only observe farther, that Ptolemy, in his treatise *De Analemmate* *, a Latin translation only of which, by Commandine, is extant, printed at Venice by Aldus, 1558 †, 4to. shows, that there are only three intervals, by nearly the same arguments as those which, according to Simplicius, he employed in his book on Dimension. His words are as follow: " Quoniam igitur

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* By the word *Analemma* the ancients signified a certain species and form of a celestial sphere, described in plano, viz. the common section of the meridian and other circles, together with the semicircles of parallels; from which the quantities of days and every thing else pertaining to dialing, might be easily obtained.

† This treatise is so rare that Fabricius says he never saw it. Vid. Biblioth. Græc. Tom 3. p. 449.

dimensiones,

This, however, is evident, that there is not a transition into another genus, as from length into superficies, and from superficies into body. For a thing of this kind will no longer be perfect magnitude; since the egression must necessarily take place according to defect: and it is not possible that the perfect should be deficient; for it is every way complete. Of bodies, therefore, which are in the form of a part, each is of this kind according to definition: for they have all the intervals. They are bounded, however, by coming into contact with that which is near them. Hence, after a certain manner each body is many; but the all, or universe, of which these are parts, is necessarily perfect; and as the name signifies is *all-perfect*, and not partly so, and partly not[3].

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dimensiones, quæ in unaquaque mole insunt, terminatas esse oportet, et positione et multitudine, sicut et magnitudine: ex omnibus autem declinationibus, quæ fiunt ad rectos angulos solæ hoc modo se habent; omnes enim aliæ et specie interminatæ, et numero infinitæ sunt: sequiter tres solas esse tales in unaquaque mole dimensiones, quoniam et solæ tres rectæ linæ ad rectos inter se angulos constitui possunt: plures non possunt:" *i. e.* "Because therefore it is requisite that the dimensions which are in every bulk should be bounded in position and multitude, as also in magnitude; but of all the declinations those which are made at right angles alone subsist after this manner; for all others are indefinite in species, and infinite in number;—this being the case, it follows, that there are only three dimensions in every bulk, because three right lines alone can be constituted at right angles to each other; but there cannot be more."

[3] Aristotle having observed that body, so far as body, is among things endued with interval perfect, because it has all intervals, since the universe also and the whole world is perfect, lest any one should think that he asserts there is the same species of perfection and *allness* both in body and the world, he very properly here makes a division, and says, that of bodies some are parts, and are comprehended in the form of a part, as the heavens, fire, air, water, and earth, but that another body is the whole of which these are parts. He also observes, that of bodies which rank as parts, the all and the perfect are predicated according to the reason and definition of body, because body is that which possesses a triple interval, and an interval every way, but yet as that which is partial, and does not comprehend all things; for it has many things external to itself, and is divided by many things coming into contact with them. On this account, also, each is many, according to the contacts of many parts. Hence it is not all and perfect, according to hypostasis or subsistence; for according to this it has a transition to something else, and on this account is imperfect. But the all and the whole of which these are parts, is not perfect according to the definition of body, but from comprehending all things, from having nothing external to itself, and not from being divided with reference to any thing else by contact. Hence in all these ways it is perfect.

Concerning the nature of the universe, however, whether it is infinite in magnitude, or whether the whole bulk is finite, must be considered by us afterwards.

Let us, however, now speak about the parts of the universe according to species, making the beginning as follows[4]. We say then, that all natural bodies and magnitudes are essentially moveable according to place: for we say, that nature is the principle of motion to them. But all such motion as is according to place, and which we call lation, is either in a right line, or in a circle, or mixt from these: for those two motions alone are simple; and this is because a right line and a circumference are the only simple magnitudes[5]. The motion in a circle,

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[4] Aristotle having shown in what manner each body is perfect, viz. the part and the whole, and that the whole is that which has nothing external to itself, perceived that a thing of this kind required demonstration, and whether as infinite it has nothing external to itself, or as finite. But perhaps, it may appear to be consequent to the discussion of the nature of a simple body to speak about the nature of the universe, and then about the parts of it. Since, however, he comprehends the discussion of the nature of the universe in that of the heavens, (for showing that the heavens are finite, he will show, that the universe is finite) on this account he rejects the discussion of the universe, first proposing to speak about the parts of it, what, and how many they are. But he very properly says, *whether it is infinite in magnitude*, because it is infinite according to the extension of its being, and according to time. He also calls *the parts of the universe according to species*, those which specifically differ from each other, viz. heaven, fire, air, water, and earth; since these are the immediate parts of the universe. For the parts of earth, and of each of the other elements, consisting of similar parts, are also parts of the universe, but not immediate parts, but parts of parts. And these are things which are properly called, not *parts*, but *particles*. The immediate parts of the universe, therefore, are these which are specifically different.

[5] Plato as well as Aristotle appears to assign another essence to a celestial body. For if he thinks that there are five speicfic elements of the five bodies, assigns the dodecaedron to the heaven or the universe, and says, that every other figure, except the pyramid, viz. the octaedron, icosaedron, and cube, are different from the celestial figure, it is evident that according to him a celestial body is essentially different. And that Plato also asserts that there are five simple bodies, according to the five figures, is sufficiently evident from the following testimony of Xenocrates, the most genuine of his associates, who, in his life of Plato thus writes: "In this manner, therefore, he distributes animals, perfectly dividing them into ideas and parts till he had arrived at the five elements, which he denominates the five figures and five bodies, viz. æther, fire, water, earth, and air." Hence, according to Plato, the dodecaedron is the figure of a simple body, viz. of the heaven, which he calls

cle, therefore, is about the middle; but the motion in a right line is upward and downward. I call, however, the motion upward which is from the middle; but the motion downward, which is to the middle. Hence, it is necessary, with respect to all simple lation, that one kind should be from the middle, another to the middle, and another about the middle. And this appears reasonably to follow from what was said in the beginning; for body is completed in three things, and also the motion of body [6].

Since,

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calls æther. But if he says that the heaven consists of fire, he asserts this of it as consisting of light; for he says, that light is a species of fire. And he asserts, that the stars are composed from the four elements, not from those in generation, or the sublunary region, but from fire, indeed according to the luminous, from earth according to sensible resistance, and from the middle elements according to middle characteristics. If, therefore, Aristotle acknowledges the visibility and tangibility of the stars, neither will he also deny that the celestial bodies are composed from the summits of these, in which the perfection likewise of the elements consists; for he is every where of opinion, that they are foreign from the four sublunary elements, which are moved in a right line and are imperfect. In like manner if, he says, that the heaven is a simple body, it is reasonable that he should deny it to be composed from the four elements. And that he asserts it to be animated, and an animal, we shall learn; and also that he is of opinion that animals have composite bodies. But that the stars are not only natural bodies, but that they are also especially moveable according to place, is at the same time evident from local motion being the first of other motions, according to all the modes of priority, as he shows in the last book of his Physical Auscultation. Dividing too natural motions, he says, that some are simple, but others not simple. But the demonstration that there are simple motions, readily follows, from admitting that there are simple motions of simple bodies. And that circular and rectilinear motions are simple is evident; for neither of them is composed from things of a different nature. But that these alone are simple motions, he shows from the hypothesis of lines; for all motion is produced on some linear extension. If, therefore, there are only two simple lines, there are also only two simple motions. For he does not suppose magnitudes to be the producing causes of motions, but considers them as the material causes, or as having the relation of things without which motions would not exist, as Alexander observes. And every motion existing, it is impossible there should not be magnitude; but magnitude existing, it is not necessary there should be motion; which consequence is adapted to matter. Simplicius adds, it is perhaps necessary to observe, that the figure of magnitude being supposed, is sometimes the cause of motion to body.

[6] Aristotle having said, that there are two simple motions, the rectilinear and the circular, defines each of them, denominating the circular motion that which is about the middle of the universe, which he demonstrates, as Alexander says, through what follows. Hence, the motion of bodies which is not about the middle of the universe, will not be a simple circular motion; for,

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Since, however, of bodies, some are simple, and others composed from these (but I call those bodies simple which have a principle of motion according to nature, such as fire and earth, and the species of these, and also things allied to these), hence it is necessary that of motions some should be simple, and others, in a certain respect, mixt; that the motions of simple bodies should indeed be simple, but those of composite bodies mixt; and that they shouldbe moved according to that which predominates in them[7], If, therefore, there is a simple motion,

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in a certain respect, it will have the upward and the downward, each part sometimes becoming upward and sometimes downward. That Aristotle also assumes the same middle in a circular and in a rectilinear motion, is evident from his saying, "*Hence it is necessary with respect to all simple lation*, &c. But he wishes to assign all of them according to one habitude to the middle. And the motions to the right hand and to the left, before and behind, when they are simple, are either made to the upward or the middle region. For the motions of animals are no longer simple, in consequence of the extension and inflexion of the members; and hence simple oblique motions, which are upward and downward are in a right line. Thus Alexander. Perhaps, however, the motion to the right and left, before and behind, is not the motion of simple bodies according to nature, but of animals which have parts situated on the right and left, before and behind. But earth and water, or any thing else of this kind, are not moved with such a motion, except they are thrown by violence, or impelled, or drawn by many things. But Aristotle assuming from evidence, that there are two simple lines, the right and the circular, and that simple motions are produced according to simple lines, syllogizes as follows: Simple motions are produced according to simple lines. Motions which are produced according to simple lines, are produced according to a right and a circular line. And the conclusion is evident. Afterwards he, in a similar manner, again assumes as evident, that in a definite sphere, that is especially a right line, which is from the centre to the periphery. Hence, in a definite sphere there are two motions in a right line; one upward from the middle, but the other downward to the middle. There are, therefore, three simple motions; one from the middle, the second to the middle, and the third about the middle.

[7] Aristotle having confirmed the first hypothesis, which says that there are three simple motions, from the middle, to the middle, and about the middle, passes on to the second and third hypotheses, showing that of a simple body the motion is simple, and that a simple motion is the motion of a simple body. But he shows this, by first dividing motions into simple and mixt, and afterwards bodies into simple and composite. And simple bodies being defined, he very properly attributes simple motions to simple bodies, but mixt motions to composite bodies. For all motion is of some body according to place. But he calls simple bodies those which contain a principle of

motion, but the motion in a circle is simple; and if a simple motion is of a simple body, (for if it is the motion of a composite body, it will be according to that which predominates) it is necessary that there should be a certain simple body, which is adapted according to its own nature to

motion according to nature. For animals and plants have also a principle of motion, yet not according to nature, but according to soul; and hence they are differently moved at different times. For composite bodies do not remain in *homoiomeriæ*, or *in the possession of similar parts,* but also receive organic parts, as having a soul which uses the body as an instrument. But nature is the principle of the motion of a simple body; and hence bodies which alone possess nature, have alone a simple motion. But what these bodies are he subjoins, when he says, "*Such as fire and earth, and the species of these, and also things allied to these.*" Denominating the species of earth indeed, the sandy and the stony, the argilaceous, the white, the black, and the like; but calling the species of fire, a burning coal, flame, and light, as Plato says. Alexander, also, well explains this as follows: Aristotle, when he says, *such as fire and earth,* adds, *and the species of these,* implying by this, universally all fire, and universally all earth, not this particular kind only, but simply every species of fire and earth, so far as they are fire and earth. But air is allied to fire, and water to earth, and this will also be the case, if there is any other simple body, as it will be shown that there is a fifth body; for this also is a natural body.

Simple motion also is one; for a simple motion is the motion of a simple body; and a simple body if it is in reality simple, contains in itself the principle of one motion, for if it contains the principle of many and simple motions, it will no longer be a simple body, but will be composed from as many things as it contains principles of motion. For in this a composite differs from a simple body, viz. in containing in itself the principles of many simple motions. One motion, however, is not always simple; for the motion of animals is not properly one, since it is produced according to the extension and inflexion of the members; but an oblique motion, such as that of some of the stars, is one indeed, but not simple, for it is composed from the upward and downward motion. The motion also, according to a spiral is composed from a rectilinear and circular motion. Aristotle adds, *it is necessary they should be moved according to that which predominates in them,* looking to the four elements as they are called, which are not properly simple but are moved with simple motions according to that which predominates; for they will not be simple in separated places, since they are generated with a view to the composition of the universe. Hence being moved according to that which predominates, they are simple in their own, but not in other places. The heavens too, according to Plato, and Aristotle does not dissent from this doctrine, are composed from the summits* of the four elements, since the heavens to be moved with a circular motion[8]. For it is possible that a thing may be moved by violence with the motion of another thing, and with another motion: but it is impossible that it should be thus moved according to nature; since there is one natural motion of every simple body[9]. Again, if the motion which is contrary to nature, is contrary to that which is according to nature, and one motion is contrary to one, it is necessary, since the motion in a circle is simple, if the motion of

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* By the *summit* of a thing the *first most pure and causal* subsistence of that thing is to be understood. The first mundane subsistence, therefore, of the elements is in the heavens, in which they subsist according to a fiery characteristic, and thus subsisting are the causes of the sublunary elements.

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heavens are visible and tangible, the summit of fire predominating in them. But the heavens are said to be simple, as also the four sublunary elements, when compared with composite bodies. For every body which is moved with a simple motion, is either simple, or is moved with such a motion, from something simple predominating in it. But if this be true, and if the body which is moved circularly is a composite, it will be moved with this simple motion, according to the predominance of something simple in it, and not so far as it is a composite.

[8] Aristotle here syllogizes as follows: Since a circular motion is simple, but a simple motion is the motion of a simple body, and of a simple body there is a simple motion, it is necessary that there thould be some simple body, which is adapted according to its own nature to be moved with a circular motion. But that which precedes is true, for it has been demonstrated; and consequently that which follows is true. Perhaps too, as Simplicius justly adds, Aristotle produces the syllogism hypothetically, from philosophic caution. But it is evident, that the hypothetic lemmas being demonstrated, it is possible to syllogize categorically, as here. A circular motion is simple. A simple motion is the motion of a simple body. A circular motion, therefore, is the motion of a simple body. Hence the body is simple, which is naturally moved with a circular motion.

[9] Aristotle having shown that there is a certain simple body which is naturally adapted to be moved with a circular motion, he shows, consequent to this, that it is no one of the four elements which is moved with a circular motion, neither naturally nor contrary to nature. And that no one of them is circularly moved according to nature, he shows as follows: If there is one natural motion of every simple body, for of simple bodies the motion is simple, and a simple motion is one, it is evident that of each of the four elements since they are simple, there is one simple motion according to nature. If, therefore, the motion of them is naturally in a right line, it is evident that a circular motion will not be natural to them. But if they are moved circularly, such a motion will be violent to them. Thus fire may be moved downward and circularly; but it is impossible that it should be moved naturally with the motion of another thing; since of every simple body there is one natural motion. But as he before demonstrated that if any composite body is moved with a circular motion, since this motion is simple, it is so moved according to the predominance of something simple in it; thus also he now demonstrates that if any thing is violently moved with a circular motion, there is always something which is circularly moved according to nature.

the body which is moved is not according to the nature of the body, that it should be contrary to it. If, therefore, it is fire, or any thing else of this kind, which is moved in a circle, the natural lation of it will be contrary to circular lation. But one motion is contrary to one; and the motions upward and downward are contrary to each other. If, however, there is any other body which is moved in a circle contrary to nature, there will be some other motion of it according to nature: but this is impossible. For if its motion is upward, it will be fire or air; and if downward, it will be water or earth [1].

It

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[1] Aristotle consequently shows, that if a circular motion does not naturally belong to any one of the four elements, any one of them that is supposed to be so moved, must necessarily be moved contrary to nature. If, therefore, it has been demonstrated that such a motion is not natural to, it must be concluded that it does not belong to any of the elements. That it is necessarily, therefore, contrary to nature, if not natural, he shows from that which subsists contrary to nature, being contrary to that which is according to nature. Hence a subsistence according to nature not being present, a subsistence contrary to nature must necessarily be present; and this and nothing else is contrary. For nature is not unjust, opposing many things to one. But he informs us in a wonderful manner what is the cause of this. For if a circular motion is not natural, it is necessarily contrary to nature, because it is simple. For if it were not simple, it might not be contrary, but only not according to nature. But that which is moved with a simple motion, is necessarily moved either with that motion, which is natural, or with that which is contrary to nature, or with some intermediate motion which will not be simple. But that no one of the four elements is circularly moved contrary to nature, he again shows, using this position, that one motion is contrary to one. For if a motion upward is natural to fire, but upward is contrary to downward, and one motion is contrary to one, a circular motion will neither be natural, nor contrary to nature, to fire. And the same reasoning will apply to each of the remaining three elements. But that a circular motion is not contrary to nature, to any other simple body, he shows from this, that there ought to be some simple motion according to nature of a body which is simple. But simple motions in a right line are alone the upward and the downward, with one of which if any thing is moved, it will be one of the four elements, and nothing else. And as there are two simple motions in a right line, the upward and the downward, not two elements only with a rectilinear motion, but four will be produced; the cause of which is assigned by Aristotle, in his discussion of the heavy and the light, viz. that earth is simply heavy, but fire simply light, because the former subsists under all things, but the latter emerges above all things; but air and water communicate with both, for they are both heavy and light, though not with reference to the same thing. Hence fire and earth are properly simple elements.

Simplicius

It is also necessary that such a lation should be the first; for the perfect is naturally prior to the imperfect. But the circle ranks among things perfect. No right line, however, is perfect; for neither is an infinite right line perfect; since, if it were, it would have a beginning and end; nor any finite right line, since there is something external to all of them; for each may be increased. Hence, if prior motion belongs to the body which is prior by nature; but the motion in a circle is prior to that which is in a right line; and the motion in a right line is the motion of simple bodies; for fire tends upward in a right line, and earthly bodies tend downward to the middle;—this being the case, it is necessary that the motion in a circle should be the motion of some one of the bodies which are simple: for we have said, that the lation of mixt bodies is according to that which predominates of simple bodies in the mixture[2]. From these things, therefore, it is evident that another

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Simplicius farther observes, that Ptolemy, in his treatise On the Elements, * and in his Optics, and also the great Plotinus, and Xenarchus in his Doubts against a Fifth Essence, assert, that the motions of the elements in a right line are made while they are in a place contrary to their nature, and not yet in a place according to their nature. To this opinion Aristotle also appears to assent, when he says, in the fourth Book of this treatise, and in his books on Generation and Corruption, that the body which tends to its proper place tends to its proper form. For if things which aspire after their proper place, and their proper *wholeness*, (ὁλοτης) are moved from a foreign place, and from a situation contrary to nature, it is evident, that when they are so moved they have not a natural subsistence, but as the above-mentioned philosophers observe, the elements, when they have a natural subsistence, and are in their proper places, are either permanent, or are moved in a circle. Earth, indeed, water, and collected air, are permanent; but fire and the highest part of air are moved in a circle.

[2] Aristotle, in the eighth book of his Physics demonstrates, that a circular is prior to a rectilinear motion, because it is perfect, simple, and properly continued; but here the demonstration is made from perfection. For that the perfect is prior to the imperfect is evident; since imperfect things are produced from the perfect. But that a circular motion is perfect, he shows from

* This work of Ptolemy, as also his Optics, is unfortunately lost. His Catoptrics too are supposed to be lost. I have, however, in my possession, a Latin translation of his Catoptrics, which, the anonymous translator says, was made in the year 1269. It consists of two small books; is illustrated with diagrams, and is printed at the end of a collection of authors on the Sphere, in the year 1518.

ther essence of body is naturally adapted to exist, besides the compositions of bodies which are here, and that it is more divine than, and prior

the circle being perfect; and he demonstrates that the circle is perfect, because it is finite, and has an end, which accords with the nature of perfect things. He also shows it from this, that the circle does not receive addition, the form of it remaining; for an addition is made to it so far as it is defective, or is not a complete circle. He shows this, however, not in the circle, but demonstrating that a right line is imperfect, because these things do not happen, but the opposite to a circle, he shows that a circle is perfect. But that every right line is imperfect, he shows, first, by dividing it into infinite and finite; for every right line is either infinite or finite. Not indeed that there is an infinite right line, since the universe, according to Aristotle, is finite, but because some have fancied that there is; and though there is not, yet a right line may be increased by the phantasy ad infinitum. If, therefore, an infinite line has not any end or bound, but is indefinite, it will not be perfect; for the perfect is that which is now consummated and bounded, and which has not any defect whatever of things pertaining to itself. But a finite right line has something external, so as to be adapted to be increased: and that which may be increased, has not yet received all that pertains to itself, and will therefore be imperfect. But a circle is finite, and has an end, and has nothing external, nor can it be increased, the form of it still remaining. Simplicius adds, that Alexander shows the circle to be perfect, because it has a beginning, middle, and end; the centre being the beginning of it, the end the periphery, and the middle the superficies, which is between these. Simplicius, however, justly observes, that Aristotle now considers the circular line according to which motion is effected, and not the superficies. On this account, Aristotle does not intend to show its perfection in the same way as Alexander does, but he demonstrates it from this, that it is finite, and receives no addition. But the periphery, indeed, will have a beginning, middle, and end, yet in a different manner, because each of these is every where; for any part of it whatever, that is assumed, may be a beginning, middle, and end. But how of every finite line is there something external to it? For the diameter of the universe being finite, what will there be beyond it; since there is nothing beyond the world, as will be demonstrated hereafter? Besides, will it not be absurd that every right line should be imperfect, if there is some form of a right line which ought to participate of perfection, in the same manner as other forms, so that if there are imperfect right lines, it is indeed necessary that there should be some one right line which is entirely perfect? Alexander, therefore, understands it in this way, that we can always conceive a right line capable of being increased; a *right line itself* not being increased, but one of a certain magnitude. Hence the form of a right line, so far as a right line is entirely perfect, both in a small and a great line: but magnitude is perfect in having the whole measure of the intermediate line. But the perfection of it, and the perfection according to form, are deficient as with reference to a circular form, and the perfection of it, because it does not converge to itself; but as far as pertains to itself is diffused to the unmeasured and the infinite. The quantity of it, however, is bounded by connectedly containing measures. This, therefore, shows that there is something external to every finite line, viz. that so far as pertains to itself, and its indefinite diffusion, it has always something deficient, and capable of receiving addition. Aristotle, therefore, assuming that the more perfect motion is prior; for the perfect, says he, is naturally prior to the imperfect; and the demonstration is, that a circle is naturally prior to a right line, as being more perfect; but as are the lines on which motions are made, so likewise are the motions;—this being the case, he concludes, that a circular is naturally prior to a rectilinear motion. He neglects, however, the conclusion as evident, explaining the two continued propositions. Afterwards, wishing to show that the body is naturally prior, which has a circular motion, and that it is simple and different from the four elements, he demonstrates this as follows: If there are two simple motions of simple bodies, viz: the rectilinear and the circular, but the rectilinear belongs to sublunary simple bodies, which are moved upward and downward, it is also necessary that a circular motion should be the motion of some other simple body, which is different from sublunary bodies. For motion always belongs to a body which is moved, and a simple motion to a simple body. For though a composite body is sometimes moved with a simple motion, as a man falling from the top of a house tends to the middle, yet he is carried downward with this motion, according to that simple element, (viz. earth,) which predominates in the mixture of his corporeal frame.

Some, however, as we are informed by Alexander, have doubted the truth of what is here asserted by Aristotle, viz. that the perfect is naturally prior to the imperfect. For if the world is more perfect than each of the things from which it is composed, but the more perfect is prior, and the prior is also more simple, the world also will be prior to, and more simple than the things from which it is composed. But it has not a subsistence, says Alexander, prior to its parts, nor does it appear to be more simple than its parts, being composed from them. Alexander, therefore, yielding to these arguments, endeavours to solve the doubt as follows: That the world is said to be more perfect, as being more comprehensive; and that a circular is more perfect than a rectilinear motion, and a circle than a right line, not as containing, but considered according to species. In things that are separate, therefore, says he, it is true that the more perfect is prior and more simple; but this is no longer true in wholes and parts. For the whole, says he, is more perfect than its proper parts, and is prior to them both by nature and essence, but is not prior in time. For that which besides being simple is also perfect, this is likewise prior in time. But that a circular is prior to a rectilinear motion, not in essence only, but also in time, Aristotle shows in the eighth book of his Physics. And such is the solution of Alexander.

Simplicius, however, well observes, that perhaps priority is not to be assumed according to time. For there was not a time when a circular motion was but a rectilinear motion was not, though the former is always the cause of the latter. Nor still more when the circle was, a right line was not. But priority is to be assumed according to *nature*. For Aristotle clearly says, "*that the perfect is naturally prior to the imperfect*: and again, "*that a prior motion is the motion of a body which is prior by nature.*" The world, therefore, being more perfect than its parts, is naturally prior to them, as Alexander also acknowledges. But it is also more simple. For if it is prior by nature, it is more united *; but that which is more united is more allied to the one, prior to all these[3]. Besides, if it is admitted that all motion is either according to, or contrary to nature, and that the motion which is contrary to nature to one thing, is according to nature to another: as in the motions upward and downward; for one of these to fire, and the other to earth, is according to and contrary to nature;—if this be admitted, it is necessary that the motion in a circle, since it is to these contrary to nature, should be to something else according to nature[4]. Farther still, if lation in a circle, is to any thing according to nature, it is evident that there will be some body among simple and first bodies, which will be adapted to be moved naturally in a circle, in the same manner as fire is moved upward naturally, and earth down-

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* For as all things originate from *the one*, multitude, which is nearer to, is more united, than that which is more remote from *the one*, because *the one* produces the similar prior to the dissimilar. But that which is nearer to *the one* is also prior.

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and a thing of this kind is more simple. We however not looking to the united wholeness of the world, according to which it is one animal, or an image of the intellectual animal resident in the intellect of the artificer of the universe, but directing our attention to its separated multitude, and calling this the world, we think that the part is more simple than the whole, and that the parts are prior to the whole. For the whole indeed, from its proper unity, produces in itself its own separated multitude.

[3] Aristotle here adds a common conclusion to what has been said; for those things being admitted, it is evident from them, that there is some other simple body besides the four elements, viz. a circular body, more divine than, and prior to them by nature. For if it has been demonstrated that a circular motion is simple, and is naturally prior to a rectilinear motion; but the motion of a simple body is simple and prior to the motion in a right line; and if that which is simple and prior by nature is also more divine, it is evident that this conclusion is deduced from what has been previously admitted.

[4] Not only from what has been said, it is concluded, that the body which is moved circularly, is different from the four elements, but this is also inferred from the arguments now proposed: the first of which, according to Alexander, is as follows: Every natural simple motion, is either naturally inherent in the simple body which is moved with this motion, or it is inherent contrary to nature. But that which is inherent in any thing contrary to nature, is inherent in something else according to nature. For this it is for a thing to be moved with a physical motion contrary to nature, to be moved with the motion which is natural to some other thing, and not according to its own proper nature; since every natural motion is the motion of something which is moved naturally. If, therefore, a circular motion is natural, and a natural motion if it is inherent in any thing contrary to nature, is inherent in something else according to nature, it is evident that a circular motion, though it should be supposed to be inherent in the four elements contrary to nature, there will nevertheless be some body besides these, to which to be moved circularly is natural.

ward. But if the bodies which are moved in a circle about the middle, are moved contrary to nature, it is wonderful, and perfectly absurd, that this motion alone should be continued and perpetual, when at the same time it is contrary to nature: for in other things, such as are contrary to nature appear to be most swiftly corrupted [5]. Hence, if that which is moved in a circle is fire, as some assert, this motion is no less contrary to nature to it, than the motion downward: for we see that the motion of fire is from the middle in a right line [6]. From all these reasons, therefore, any one syllogizing may believe that there is a certain other body different from the bodies which are here, and which surround us; that it is separate from these, and has a nature by so much more honorable than, as it is more distant from, sublunary bodies[7].

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[5] From division, Aristotle again shows the same thing, that the body which is moved with a circular motion is different from the four elements. But what he says is in effect as follows: A circular motion, because it is a natural and simple motion, is inherent in some natural and simple body, either according to or contrary to nature. And he employs an abundant division, because it is evident that this motion being natural, is entirely inherent in something according to nature. But in consequence of the division being inevitable, he at the same time introduces the problem multifariously. Here also he adds the argument when he says, "*if lation in a circle is to any thing according to nature,*" since it is simple and the first, which has been demonstrated, but every motion is always the motion of some body which is moved;—if this be the case, there will be some body among simple and first bodies, which is naturally adapted to be moved with this motion, and which is different from the bodies that are moved in a right line. For as they are moved in a right line, so this is moved in a circle. But if a circular motion is unnatural to that body in which it is inherent, or in other words, if those things which are moved circularly are moved contrary to nature, it is wonderful, and perfectly irrational, that a circular motion being unnatural, should alone be continued and perpetual, which it is demonstrated to be in the eighth book of the Physics. For that is wonderful which very much deviates from the usual course of nature. But it is perfectly irrational, that any thing contrary to nature should be the cause of a continued and perpetual motion; for in other things, whatever is contrary to nature is seen to be most rapidly corrupted. For every nature labours, when it operates not according to its own form. For things which are moved naturally, are moved by a power naturally energizing from itself, and which is co-existent with them. And hence they are moved without labour. But things which are moved contrary to nature, rather suffer than energize, not being moved by a natural power, but being externally impelled by violence. On this account natural bodies are not in want of rest, because they energize according to their own nature. But the bodies of animals are perfectly in want of rest; for psychical motions, or the motions belonging to soul, are not the natural motions of their bodies, which are moved as instruments by the souls that use them.

[6] Aristotle having shown that a circular motion is not contrary to nature to the body which is moved in a circle, if it is continued and perpetual, shows in common, employing what has been before

Since, however, of the things above asserted, some are supposed, but others are demonstrated, it is evident that not every body has either levity or gravity. It is also necessary that it should be supposed what we say the heavy and the light are, sufficiently for our present purpose, but again, more accurately, when we make the essence of these the subject of consideration. Let the heavy, then, be that which is naturally adapted to tend to the middle; but the light that which is naturally adapted to be moved from the middle. And let the most heavy

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before demonstrated, that fire is not a body which is circularly moved. But he shows this as follows: If fire is a body which is circularly moved, it follows that a circular motion is inherent in it contrary to nature, no less than a tendency downward. But if a circular motion is not inherent contrary to nature in that which is moved in a circle, if it is continued and perpetual, the body which is circularly moved is not fire.

[7] Faith is two-fold, the one without demonstration being irrationally produced, and which some men possess about things the most absurd; but the other being after demonstration, and replete with evidence. This faith also is accurate, cannot be confuted, and is allied to the truth of beings. Since, therefore, what has been above said has been asserted with demonstration, Aristotle very properly says, *that any one syllogizing may believe*. But a faith of this kind excels in scientific knowledge, with vital sympathy. Hence, Aristotle philosophically and properly uses the words *may believe*; because, together with the firm knowledge of more divine natures vital sympathy is co-excited. The words also, *may believe*, may be considered as implying that he syllogises from hypothesis. And it is evident, that as is the relation of hypotheses to evidence, such also will be the conclusions deduced from them to faith. But, as Simplicius beautifully adds, it is better to say that faith every where imparts that which results from necessary conclusions. And that especially in the discussions of divine concerns, the vital sympathy arising from faith after demonstration, not only produces stability of real knowledge, but also union with the objects of knowledge, which is the end of human blessedness. For anagogic love precedes, exciting in the soul the desire of divine beauty; the true unfolding of it into light by those who are worthy to receive it follows; and faith succeeds in the last place, imparting a firm establishment in, and union with the divine object itself. But that by how much the more the celestial bodies are separated from things in generation and corruption, by so much the more they excell in dignity of essence is evident. For these last are expelled to the extremity of the universe; but the heavens are allotted the summit of the corporeal sphere.

heavy be that which subsists under all the bodies that tend downward; but the most light, that which rises above all the bodies that tend upward. But it is necessary that every thing which tends either upward or downward, should either have levity or gravity, or both, but not with reference to the same thing; for things heavy and light refer to each other; as for instance, air to water, and water to earth[8]. It is, however, impossible that the body which is moved in a circle, should have either gravity or levity: for it is not possible that it can be moved either to the middle, or from the middle, either according to, or contrary to nature. For lation in a right line is not natural to it; since there is one motion of each of the simple bodies; so that it will be the same with some one of the bodies that are moved in a right line. But if it is moved contrary to nature, if indeed the motion downward is contrary to nature, the motion upward will be according to nature; but

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[8] Since all doctrine and every raciocinative discipline are produced from pre-subsisting knowledge, as Aristotle teaches us in his Posterior Analytics, it is necessary that certain things should be supposed prior to demonstrations; some as being credible from themselves, others as having been previously demonstrated, and others as things to be demonstrated. This being the case, certain foundations are here laid down; and certain things are also demonstrated. Certain things indeed are pre-supposed, viz. that there are two simple lines, the right line, and the circumference of a circle; and that the motion from the middle is upward, the motion to the middle, downward, and the motion about the middle, circular. Also, that one motion is contrary to one; and that there is one natural motion of every simple body. But of the foundations it is demonstrated, that there are two simple motions, viz. the circular and rectilinear; that the motions of simple bodies are simple; and that simple motions are the motions of simple bodies. For this is demonstrated from the division of motions and bodies, and from appropriate adaptation. It is also demonstrated from the things supposed, and from the demonstrated foundations, that besides the four sublunary simple bodies, there is another fifth body, to which a circular motion is natural, and that this is more perfect, prior to, and naturally more honorable than other bodies: These things being supposed and demonstrated, Aristotle says, it follows, that not every body has either gravity or levity. For if the heavy and the light from the proper definition of them appear to belong to a right lined motion, but it has been demonstrated that the body which is moved circularly, is different from those which are moved in a right line; and if different, the motion in a right line can neither happen to it contrary, nor according to nature, it evidently follows, that not every body has gravity or levity. But this contributes to his demonstrating that a celestial body is without generation, is incorruptible, without increase, without diminution, and without alteration. For if it had gravity or levity, there would be some motion contrary to its motion. And if this were the case, there would be something contrary to it, which would be moved naturally with a motion contrary to it. But if this took place, it would be generated from contraries, and corrupted into contraries. If, however, it has neither gravity nor levity, neither in short, will it be moved in a right line, according to which there is contrariety, but it will alone be moved in a circle. But it has been shown that there is not any motion contrary to a circular motion; and hence it is evident, that the body which is circularly moved, will not have any thing contrary to it, so far as it is neither generated from any thing else, nor corrupted into any thing else. It is necessary, therefore, that it should neither have gravity nor levity. At the same time, also, Aristotle previously assumes, that it will neither be moved upward nor downward, which

which is equivalent to its not being moved with a motion which has contrariety. Afterwards, having shown that to the circular motion with which it is moved, there is not any motion contrary, it will follow, that there is not any thing contrary to it. And from this it necessarily follows, that it is neither generated nor corrupted. But all the rest is consequent to this. *It is also necessary*, says he, *that it should be supposed what we say the heavy and the light are;* because, it is not his principal intention at present to discuss the heavy and the light, as in the fourth book, where he particularly considers them, but he now requires this hypothesis, in order to show that the body which is moved in a circle is without generation and corruption, from its not having either gravity or levity, as he sufficiently manifests in the text. But he defines what the heavy and the light, and also what the most heavy and the most light are. For since of things which tend downward, one thing, as earth, proceeds as far as to the center, viz. as far as to that which is most downward, but another thing proceeds as far as to the earth; and since of things which tend upward, one thing, fire, proceeds as far as to the highest place, viz. as far as to the lunar sphere, but another proceeds as far as to fire; hence the one is very properly heavy, but the other most heavy; and the one is light, but the other most light. If, therefore, the heavy is that which tends downward, and the light that which tends upward, and these are the definitions of the heavy and the light, it is evident that conversely, that which tends upward or downward, has necessarily gravity or levity. And since of the upward there is something which is not perfectly upward, but which has something of the downward, as the place under fire; and since of the downward again, there is something which is not perfectly downward, as the place of water, the bodies which are moved to these places, have justly both gravity and levity. They have not both these, however, with reference to the same thing; for it is not possible at the same time to be heavier and lighter than the same thing, but the heavy and the light pertain to these relatively. For air indeed is light, with reference to water, but heavy with reference to fire; and water is light with reference to earth, yet not with reference to air; for compared with this it is heavy. Hence, these are neither properly heavy, nor properly light, nor properly simple. But fire is light and properly simple; and earth is heavy and properly simple; the former rising above every thing which tends on high, and the latter subsiding under every thing which tends downward. Hence, if the middle elements are not perfectly simple, the discussion of simple bodies will not properly pertain to them; nor do they act well, who endeavour from these to change the above-mentioned opinions about simple bodies.

if the motion upward is contrary, the motion downward will be according to nature. For we have supposed of contrary motions, that the thing to which one of these motions is contrary to nature, has the other according to nature [9]. Since, however, the whole and the part tend naturally to the same thing, as for instance, all the earth and a small clod, in the first place it will happen that the body which is moved in a circle, has neither any levity nor gravity; for if it had, it would be able to tend according to its own nature, either to the middle, or from the middle. In the next place, it is impossible that it should be moved with local motion, either by being drawn upward or downward; for neither it, nor any one of its parts, can be moved with any other motion, either according or contrary to nature; since there is the same reason of the whole and its part [1].

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[9] Aristotle using the assigned definitions of the heavy and the light, or rather the conversions of the definitions, shows that it is impossible for the body which is moved in a circle, to have either gravity or levity. For if it had, it would have it either according to, or contrary to nature. But he demonstrates that neither of these is possible, employing for this purpose two axioms; that there is one natural motion of every simple body; and that to the body, to which one of contrary motions is contrary to nature, the other is according to nature.

[1] Aristotle having shown that the body which is moved in a circle has neither gravity nor levity, he demonstrates in the next place, that this is not only the case with the whole, but also with its parts; for these also being moved with the same motion as the whole, have neither gravity nor levity. But he demonstrates this in the first place, as follows: Assuming that the whole and the parts are naturally moved to the same thing, he thus syllogizes: If the whole neither tends upward nor downward, this will also be the case with the part. But the antecedent is true, and therefore the consequent. But that the pre-assumed axiom is true, viz. that the whole and the part naturally tend to the same thing, he shows from the whole earth, and a small clod. For if the whole is all the parts, but all the parts have the same tendency, it is evident that the whole has the same tendency. In the next place he demonstrates the same thing in a consequent order, about the whole and the parts; that it is impossible for them to be locally moved, by being drawn upward or downward. *For neither it,* says he, *nor any one of its parts can be moved with any other than a circular motion according to nature.* For there is one natural motion of every simple body. Nor can it be moved contrary to nature with any right-lined motion; for the contrary motion would be natural to it; and there will no longer be one natural motion of every simple body, if there are two motions according to nature contrary to one motion which is contrary to nature. But it is evident, that in order to demonstrate this, he is in want of that which has been previously acknowledged, viz. that the whole and the part naturally tend to the same thing, if it is

In like manner it is reasonable to think respecting it, that it is ingenerable and incorruptible, without increase and unalterable, because every

is also necessary that it should be verified about the part. This whole argument, however, about parts, was essentially necessary to be added to what has been said by him who shows that the parts are of the same nature with the whole: because the wholeness of the sublunary elements have the heavy and the light, and not the divulsed parts of them only, as it has appeared to some. Hence, he immediately pre-assumed that the whole and the part naturally tend to the same thing. He also replies to the objection, which says, that the comparison between the heavens and the sublunary elements is not to be made from similars; but that the parts of the latter are to be considered as being disposed contrary to nature, out of their proper places, and the whole of the former. He also replies to those who think that the heavens have a subsistence similar to sublunary natures, so as to be perpetual in its *wholeness*, but generable and corruptible in its *parts*. For if indeed in the sublunary elements, the parts appear to be divulsed from their proper wholeness, disposed contrary to nature, and having a tendency to motion in a right line, but no one of the celestial bodies, in the whole of the past time, appears from tradition to have suffered any change either in the whole of itself, or its parts, it is evident, that the heavens are justly said to be of a nature different from that of the four elements. And the assertion appears to derive credibility from the perpetual tradition of sense.

But how does he infer that the part has the same motion with the whole, from the whole earth and a clod, tending to the same thing? For the whole earth being situated about the middle, is not moved with any lation. May we not say, that he calls the whole earth the earth, considered according to all its parts, but not considered according to its wholeness? Hence, he says, *all*, but not the *whole* earth. So that if any one should say that all the earth is generable and corruptible, because all its parts are so, and no one of them is perpetual, yet it is not true to assert this of its wholeness. And, in the next place, though all the earth is not locally moved, according to the whole of itself, yet the whole has a mutation and tendency to the center. Hence the whole is conglobed about the same thing, each of the parts striving to approach to the centre, when it is not prevented by another part. For the desire of the whole and the parts is to the middle; and in it they wish to be preserved and contained, having in their own nature an erratic consistence. Thus also both the whole and the parts of fire aspiring after a divine body, as of a kindred nature with themselves, hasten to it on all sides. Hence fire is conglobed under it, all its parts desiring to approach to it, and partake of its vital motion. But each of the middle elements has, according to its own tendency, that which is near to it for an object of desire; water, indeed earth, becoming established by it, as being in itself of a flowing nature. Hence also, this flowing round the earth, is conglobed about it, and receives itself through the middle of the earth, a centrieal continuity. But air proceeds to fire, both the whole and the parts desiring to be changed from their turbulent grossness, and to become etherialized. The heaven, however, as being more divine and elevated than all the bodies in the world, has no other body as an object of desire, nor does it proceed to any other, but comprehending itself, and desiring itself, and its own soul and intellect, is not moved with a rectilinear motion, which is defective and every thing which is generated is generated from a contrary and a certain subject, and in a similar manner is corrupted from a contrary into a contrary, as was observed in our first treatise. But of contraries the lations also are contrary. But if nothing can be contrary to this, because to the lation in a circle, no motion is contrary; nature appears to have very properly exempted from contraries that which is about to be unbegotten and incorruptible; for generation and corruption exist in contraries [a]. Besides, every thing which is increased, is increased; and

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and imperfect, and proceeds to something external, but with a circular motion which is always perfect and energetic, and contains good in itself. Simplicius adds, and if I say any thing to the purpose in thus speaking, Aristotle well observes, that the whole and the part naturally tend to the same thing. Hence, of things which have the desirable external to themselves, both the wholes and the parts aspiring after it have the tendency of a right-lined motion. Hence too their tendency in short is external, because the object of desire is external, and the external is local. And if from hypothesis the heavens were elevated higher from the region which they now occupy, fire would follow it. For the four elements do not appear so much to aspire after place and wholeness, as to come into contact with a more excellent nature, which the whole no less aspires after than the parts.

Simplicius farther observes (in replying to the objections of Philoponus, a man full of perverted conceptions), that the most divine Plato, considering every thing in the world as vital, possessing a desire of its proper good, and through this having a tendency to its wholeness, and to the most excellent of the bodies near it, naturally, and not from deliberate choice; in like manner knew that earth and fire are moved to their proper objects of desire, and that on this account every thing is generated in its appropriate place. Because, however they are imperfect, they naturally, and not from previous choice, tend to the objects of their desire, but are moved towards it like things falling to the earth; and on this account Plato calls the place to which such things tend downward. For he thus writes in the Timæus: "This one thing must be considered about all these, that the path to that which is con-nascent to each, makes that which is moved to be heavy, and the place to which a thing of this kind tends, to be downward." Hence, he does not think that the heavy and the light are naturally different, since all bodies appear to be naturally heavy *.

[a] Aristotle having shown that the body which moves in a circle, is different from sublunary bodies, is more perfect than, and prior to them, and that it has neither gravity nor levity, demonstrates as consequent to this, that it is ingenerable and incorruptible, and without increase and diminution, as being changed with no one mutation, except that which is local, and this circular.

[*] The reader, however, must be careful to remember, that *gravity*, according to Plato, is the *tendency* (ῥοπη) of bodies to their appropriate places; and this meaning of gravity, which Aristotle also admits, is very different from the common acceptation of the word.

and every thing which is diminished is diminished, by a kindred nature acceding, and being resolved into matter. But this has not any thing from which it is generated. If, therefore, it is without increase, and incorruptible, to apprehend also that it is without any change of quality, is the progeny of the same scientific conception; for *alliation is a motion according to quality.* But the habits and dispositions of quality, are not produced without mutations according to passions, as for instance, health and disease. Such natural bodies, however, as are changed according to passion, all these we see possess increase and decrease; as the bodies of animals and the parts of these; likewise of plants, and in similar manner of the elements. So that if the body

As, therefore, in what has been before said, he assumed its transcendency with respect to sublunary natures, from the difference of motion, so now he assumes the ingenerable nature of the heaven, with reference to the generable nature of sublunary bodies, and its being without increase and diminution, from the form of circular motion. And in the first place he shows, that it is ingenerable and incorruptible, syllogizing as follows, in the second figure: The body which is moved in a circle has not a contrary. That which is generable and corruptible has a contrary from which it is generated, and into which it is corrupted. And the conclusion is, the body therefore which is moved in a circle, is neither generated nor corrupted. But of these two propositions, the minor which says, that the body which is moved in a circle has not a contrary, he demonstrates now; but he refers the reader, for the demonstration of the major proposition, to the first book of his Physics. For he calls his Physics his first treatise, as containing the discussion of physical principles. But that the body which is moved in a circle has not a contrary, he demonstrates again through the same deduction, as follows: The body which is circularly moved has not a motion contrary to its own natural motion. That which has a contrary, has also the motion with which its contrary is moved, contrary to its own natural motion; which he enforces through this, that the motions of bodies which are naturally contrary, are contrary. And the conclusion is, the body which is moved in a circle has not a contrary. And here again he assumes the major proposition as evident; for of forms which are naturally contrary, the natures are contrary, because the motions are contrary. For nature is a principle of motion. But he afterwards demonstrates the minor proposition, which says, there is not a motion contrary to the motion of a circulating body, *i. e.* to a circular motion. The whole, however, of what is said, is divided into these two assertions, the one, that if it is requisite any thing should be generated or corrupted, it is entirely necessary there should be some subject and a contrary from which it is generated, and into which it is corrupted; but the other, that there is not any motion contrary to a circular motion. And of this latter assertion he shortly after gives a demonstration multifariously; but he assumes the former as being demonstrated in the Physics, without demonstration. It is necessary, therefore, to recollect what is there said.

which moves in a circle possesses neither increase nor decrease, it is reasonable to suppose that it is also without change in quality[3]. From what has been said, therefore, it is evident that the first of bodies is perpetual, and that it has neither increase nor diminution, but is undecaying,

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[3] In the same manner as Aristotle demonstrates the inaugmentable through the ingenerable; for this has not any thing, says he, from which it is generated; so he shows the not being changed in quality through the inaugmentable, and the undiminished, which now, says Simplicius, I think he calls incorruptible, syllogising as follows: That which suffers alliation is changed in quality. That which is changed in quality, is changed in passion. For corporeal qualities being predicated in a three-fold respect; either according to sensible passion only, as when any one is heated superficially; or according to disposition, when any thing is disposed according to heat, so as that it is said to be hot; or according to habit, when the disposition is permanent;—this being the case, passion is surveyed every where, on which account Aristotle also says, that the habits and dispositions of quality, are not produced without mutations according to passions. For though habit is one form, and disposition another, yet these also are perfected in conjunction with passion; since they are generated in consequence of something suffering, because things which are changed in quality, are changed according to passion. But we see that all natural bodies have increase and diminution; for this is evident in the bodies of plants and animals, in simple bodies, and in short, in whatever is changed according to passion. If, therefore, things which are changed in quality, naturally increase and diminish, things which are neither increased nor diminished, are not changed in quality; for neither are they changed according to passion. And categorically thus: Things which are changed in quality according to passion, are increased and diminished. A circulating body is neither increased nor diminished. A circulating body, therefore, is not changed in quality according to passion.

In the next place it must be observed, that Aristotle does not deny all change in quality of the celestial bodies; for he does not deny a perfective communication with and participation of each other; but he denies that alliation which is attended with passion, and which often, though accidentally, becomes the cause of increase and diminution. For things which are dried and suffer the passion of dryness, and especially according to disposition, and still more so according to habit, are diminished. And things which are moistened, are increased by the opposition of moisture. Thus also things which are inspissated are diminished, but those which are rarefied are increased; except that though increase and decrease are not considered as causes, yet they do not always concur with passions that may be changed in quality, nor yet with every change in quality. For it is evident that the celestial bodies also energize on each other, and impart to each other their goodness, and this differently at different times, according to different configurations. Thus the moon at different times receives the solar light in different parts of her orb, according to her different distances from the sun. And thus all the celestial bodies energize on each other, though such alliations are to us occult. This indeed is evident from their effects in the sublunary region; for at different times they become the causes of different effects, according to their different configurations and different temperaments. Nor in the moon, does increase or decrease appear.

pear to be made with such a change in quality; nor does it so clearly exist in the other stars, except when they are nearer to, or more remote from, the earth. For then, on account of the interval being different with reference to us, they appear to us to have a different magnitude. Nor are their participations passive, but perfective. For these contraries may be co-existent; but here, on account of the opposition of things to each other, they are not naturally adapted to be co-existent. Hence, they exterminate each other, and on this account energize passively. For iron when it is heated by fire, being passively changed in quality, can no longer refrigerate, though it is naturally cold, because it energizes according to passion; but the moon, though it is in a certain respect changed in quality by the solar rays, and in consequence of this transmits to us the solar light, yet it is in conjunction with its own characteristic property. For the alliation does not cause any change in its essence, but only perfects its inherent powers. For it was well said by Melissus, that what is essentially changed in quality during the space of three thousand years, will perish in the whole of time. Indeed, though it should be asserted, that the celestial bodies are changed in quality by each other, yet it must not be said that this alliation is effected by passion, but that it is of a perfective nature; just as the soul may be said to be changed in quality, when energizing enthusiastically, or under the influence of divine inspiration. For passion is produced according to a mutation of something essential; on which account the alliation which is according to passion, is different in species from that which is according to virtue. On which account, Aristotle does not simply deny all alliation of the celestial bodies, but that only which is passive, and with which a certain increase, diminution and corruption are co-existent.

Simplicius adds, that Aristotle very properly says, that things which are passively changed in quality suffer also essentially. For the passion receiving intension, always produces a mutation of the elements which compose essence. He also very properly denies passive alliation of the celestial bodies, being satisfied with what has been previously demonstrated. For if things which are passively changed in quality, and suffer essentially, are generable and corruptible, and may be increased and diminished, it is evident that things which are exempt from these, transcend passive alliation. Hence, when Alexander says, that the spheres which are beneath the sun are heated by it, and transmit the heat hither, this assertion must be understood with restriction; by no means granting that any passive quality happens there; for if it did, it would also produce an essential mutation. But it must be said, that a certain perfective and vivific alliation is co-existent with the natural distributions from the sun, and which does not cause any change in them, like that alliation which is according to passion. For the air here passively receiving the prolific heat of the sun, passively heats terrestrial natures; since these natures not only passively receive the solar defluxions, but also the defluxions of the other celestial bodies. But if a celestial body is impassive to all mortal difficulty, it is evidently remote from every passion which belongs to mortal natures. Hence, the passive heat which is here, and which when intense dissolves the essence of a thing, does not belong to a celestial body. Hence too, if that alone is called undecaying, unchanged in quality, and impassive, if any one believes in the things which have been supposed [4].

Reason also appears to bear witness to the phænomena, and the phænomena to reason. For all men believe that there are gods, and all men, both Barbarians and Greeks, who think that there are gods, assign the highest place to a divine nature, thus conjoining the immortal with the immortal; for it is impossible it should be otherwise [5]. If, therefore,

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called passion which is generative, all passion, so far as it is such, must be denied of a celestial body. But if there is a certain passion perfective of a celestial body, such as has been above-mentioned, and which is adapted to this body, this will be the subject of a different discussion. If too some one should suppose contrary colours, or other contrary qualities in the celestial bodies, neither will these be corruptible, in consequence of contraries there co-existing in concord, and without sedition, as we have frequently observed; on which account neither are the energy and passion, which they have with reference to each other passive, because they do not change into each other.

[4] Simplicius observes, that Aristotle appears to him not in vain to have added the word *impassive*, but that he might show the heaven to be void of all passive accidents. But the words, "if any one believes in the things which have been supposed," allude to the first hypotheses, from which the demonstrations are framed; and concerning which Plotinus says, "there will be no difficulty to Aristotle, if his hypotheses of a fifth body are admitted," referring doubtless to the present text. All the lemmas likewise from which the demonstrations are concluded, may be called hypotheses. Perhaps, however, it will be better to say, that Aristotle here refers to the hypotheses, that there is not any motion contrary to a circular motion; and also to this, that things generable and corruptible, are generated from, and corrupted into contraries. For assuming these as hypotheses, he concludes that the heavens are ingenerable.

[5] Two things here contribute to the belief of the truth, demonstrative reason, and the common conception of mankind, or the evidence of sense. And these things indeed according, and especially in physical concerns, which have their demonstration from similars, indubitable faith is produced; but when these are dissonant, a certain doubt remains. Very properly, therefore, after demonstration, Aristotle adduces credibility from the phænomena, which to some persons, and to the many, is considered sufficient evidence. But he adduces three testimonies to the phænomena; one, the opinion entertained by men of the celestial bodies; another, from sense, and the memory about them; and the third, from the appellation of æther, which is given to the heaven. Perhaps too, Simplicius adds, he now produces as a testimony, the opinion of all men that there are gods, because all men who think there are gods, (and all thus think, except Hippon and Diagoras, and any others in places unknown to us, who may have fallen into this infelicity) assign the highest place to divinity. Aristotle, however, does not prove that there are gods, from the existence of such bodies, but only, perhaps, considers them to be gods as the habitations

therefore, there is something divine, as there is, what has been now said by us about the first essence of bodies, has been well said[6]. But this also sufficiently happens through sense, so far as pertains to human belief. For in the whole of past time, according to successive tradition, no change appears to have taken place, either in the whole of the extreme heaven, or any of its proper parts[7]. The name too, by which

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habitations of the gods. For that there are eternal and intelligible gods, he demonstrates in the eighth book of his Physics, and in the twelfth book of his Metaphysics. But Alexander understands the words, "conjoining the immortal with the immortal," of the celestial region, and a celestial body, as if this also were a god. He also understands the words "for it is impossible it should be otherwise," as signifying that it is impossible the highest place should be divine, if divinity were not there. And this indeed is true. For, says he, an immortal celestial body and place, are adapted to divinity who is immortal; and this cannot be otherwise. But that all men, and not only Greeks but Barbarians entertain this opinion, shows that in the souls of men, there is a certain natural conception of this kind.

[6] If there is any divine body, says Aristotle, *i. e.* a body which is naturally moved with a circular motion, what has been said about it has been well said. But Alexander well observes, that the words, "If, therefore," are assimilated to a sub-continuative conjunction, on account of evidence. For if there are mundane gods, which he omits to demonstrate, as a thing approved and manifest, there is a certain divine body suspended from them. If, therefore, there is a certain divine body, what has been said of the body which is circularly moved, has been well said, because this body is divine, as is evident from the common opinion of mankind.

[7] This is the second faith added by Aristotle to what has been demonstrated about the body which is circularly moved, viz. that it is ingenerable, incorruptible, and impassive. But the faith is from the evidence of our sense derived to us from antiquity; from which also the memory of such things is delivered. I have heard, indeed, Simplicius adds, that the Egyptians have in their writings observations of the stars for not less than **five thousand years*, and the Babylonians for a still greater number of years. But for so great a length of time, nothing is related of the heavens, different from what is seen at present; neither about the number of the stars, nor about their magnitude or colour; nor yet about the restitutions of their motions. If, therefore, in so many years, no account is given of their having suffered any change, but it appears that they have always remained in their acme, how is it possible that losing their acme they should at length be corrupted? They, however, (that is, the Christians) say, that these are the last days of the

* In the original ουκ ελαττοσιν η δισχιλιοις ενιαυτοις, i. e. *for not less than two thousand years*. But a Latin translation of this commentary of Simplicius in my possession, by Guillermus Morbetus, Venet. 1540, has, *Non paucioribus, quam a quinque millibus annorum*, which I have no doubt is the true reading, and have accordingly adopted, as being more agreeable to what is related by other authors of the Egyptian antiquities. This translation of Morbetus, which is very faithful on the whole, and which is said by the editor to have been compared with the most faithful Greek copies, has enabled me in many places to correct the Greek edition of Aldus.

which we also have called it, appears to have been delivered in succession from the ancients, who had the same opinion about it, as far as to the present time. For it is necessary to think that the same opinions have reached us, not once or twice only, but an infinite number of times. Hence, in consequence of the first body, being something different from earth and fire, air and water, they denominated the highest place æther, assigning it this appellation from always running for a perpetual time. Anaxagoras, however, uses this name improperly; for he denominates it æther as equivalent to fire [8]."

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the world; though if the heavens only remained invariably in the same state for one hour, they would evidently be exempt from generation and corruption. For every thing which is generated in the beginning of a certain time, advances as we see from the imperfect to its own perfection and acme; and again, from its acme tending to its declination, is corrupted. But that which in the whole of time known to mankind, has remained in the same state, is indubitably without generation and corruption [*]. But Aristotle calls the extreme heaven the body which is circularly moved, contradistinguishing it to the whole world, which is also called heaven. Simplicius farther adds, that what another writer would have used as most evident demonstrations, Aristotle uses as persuasive arguments, after demonstrations.

[8] Aristotle adds the third persuasive argument about the perpetuity of the heaven, viz. that derived from the name delivered to us by the ancients. But he unfolds to us two conceptions from the name arising from those who established it. For they denominated it *æther*, as being in the highest place, and situated above all the sublunary elements; each of which they called by a certain proper name, eminently denominating the heaven æther, insinuating by this, that it is the extremity, the most excellent, the most attenuated, and the most pure of the bodies which are under it. Aristotle also shows, that the name *æther*, which signifies *to run* perpetually, implies that a perpetual motion and perpetuity of subsistence belong to the heavenly bodies. But wishing to show that not only the founders of this name even to the men of his time entertained this opinion, he says, that the same opinions are frequently circulated among men; though during certain intermediate intervals they no longer exist. *It is evident, indeed, that the same true opinions must often exist among men; for the nature of things being permanent, it again brings back to itself those who a little before wandered in error. But false opinions being indefinite, and produced in souls indefinitely moved, it is not necessary that the same should always return.* Aristotle also accuses Anaxagoras, as not properly etymologizing the word æther from *αιθειν*, *to*

[*] The only real change the heavenly bodies experience is an alteration in their figure and light, as has been before observed. The changes, therefore, in these bodies, which, according to the moderns, indicate their corruptibility, are merely apparent, and not real.

CHAPTER II.

Let us now, however, enumerate with Simplicius the significations of the generable according to Aristotle, and show more fully than we have in the first book, of what kind the generation is which he manifestly denies of the heavens.

That which derives its essence then from something, is said in common to be generable. For that which is generated, is generated by some maker. And it is impossible, as Plato says, that it should have a generation without a cause. But it is evident that according to this signification of the word, the first cause of all things is ingenerable, one, and most simple; since all things participate of *the one*, and that which does not participate of it is nothing. But *the one* in no respect participates of multitude; so that every thing generable is multitudinous. For multitude subsists proximately from *the one;* since it is necessary that multitude should participate of *the one*, that it may not be infinitely infinite. But *the one* which is properly one has no representation of multitude. The multitude, too, which first proceeds from *the one*, as being the nearest participant of it, is also one, as being characterized by unity, and abiding in *the one*. Hence that which, in any respect, proceeds from *the one*, in a certain respect also possesses the generable; and on this account theologists have delivered to us THEOGONIES, or GENERATIONS OF THE GODS: acknowledging indeed, multitude abiding in *the one*, and proceeding thence, according to multiplication: but celebrating the *generation* of it, so far as it derives its subsistence from *the one*; just as we survey the generation of numbers proceeding from the monad. So far, therefore, as this first multitude

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burn, and on this account using it for fire. For if this were the natural conception of the word, *fire* would be called by us *æther*. What advantage, therefore, would be derived from using two names in the signification of one thing, concealing at the same time one of the things signified?

multitude abides in *the one*, it subsists according to the highest union, *separation* not yet becoming apparent, in which *non-being* first presents itself to the view. This first multitude, therefore, is being, and is also itself the principle of beings, and is not that alone which subsists from the principle. But the principle is unbegotten, as Socrates shows in the Phædrus. For this self-subsistent [9] multitude, the immediate progeny of *the one*, is the first being, and is properly being. For that which is simply *the one* is the cause of being, under which the self-subsistent shines forth, exhibiting in itself a duplicity of the producing and the produced. But the first multitude being vanquished by *the one*, derives the power of giving subsistence to itself from *the one*, but its being produced from *multitude*. And hence it is not simply one, because *the one* is above it which is the cause of all beings. The first, however, and most principal being is a whole, subsisting at once, both according to existence, and the extension of existence. Hence, also, eternity is here which imparts perpetuity of being. For the multitude being united, or rather being a multiplied one, neither properly exhibits production according to essence, nor extension according to existence. Hence, what Aristotle calls *that which is being*, (το οπερ ον) is *true being*. But that which proximately subsists after this, and which is moved by being, is different from it, and according to this motion subsists. And as the first being is self-subsistent, so this is generated self motive. For so far as it is moved by being, it subsists through motion, but so far as it is most near to being, and is not yet distant from itself, it becomes self-motive; (just as that which is prior to it was self-subsistent) having that which moves the same as that which is moved, in consequence of still adhering to *the one*, and being vanquished by it. But from this another multiplied nature proceeds, which also participates indeed, in a certain respect, of *the one*, yet does not abide in *the one*, nor is vanquished by it. Hence, being distributed into parts, it is no longer self-subsistent, nor self-motive, because it has not a cause in itself which gives subsistence according to *the one* [1], as the united has, and that which is proximate to it, the self-motive nature. But it immediately sustains an extension of essence; and on all sides proceeding, and spreading from *the one*, it becomes body, and whatever is allied to body. Time also proceeds together with it, from that eternity which is con-subsistent with the first being, numbering the extension of its existence, and imparting temporal perpetuity. This, however, is no longer a simultaneous whole, neither according to essence, nor according to the extension of its existence, or, as some one might say, its life. Hence a thing of this kind is not properly being, since it approximates very much to non-being, nor is it for a moment individually the same, but continually different, through its profound union with the effluxive nature of time. Hence, neither does it at once receive its whole generation from its cause; for in this case it would be true being; but as far as it is able it receives its generation partially. In short, the multitude which is in this having departed from *the one*, and participating of it adventitiously, becomes a composite instead of the united. Hence it derives both its perfection and subsistence externally. For united multitude containing *the one* in itself, since *the one* gives subsistence to all things, though it proceeds from that alone which causes it to subsist, yet having in itself a derived subsistence, it becomes self-subsistent. But a composite multitude has *the one* of its composition adventitious; and this becomes immediately that which is one form, as in matter, viz. being generated in the separation and extension of a multitude of this kind; just as the self-motive nature subsists between both. That as form in matter, therefore, it participates of *the one*, on account of its composition, and that it is not a whole subsisting at once, neither according to essence, nor according to the extension of existence, and that it is by no means the cause of existence to itself, on account of its participation

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[9] That *the one* is prior to the self-subsistent, is demonstrated by Proclus in his Elements of Theology, to my translation of which I refer the reader.

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[1] It must be observed, that there is an order of *the one*, as well as of *being*, and that as the latter is essential, the former is super-essential. Thus every divine intellect, and every divine soul, contain in themselves a *one*, which is derived from the first one, and gives subsistence to their natures. See the notes to my translation of the Parmenides.

ticipation is evident. Hence, it no longer contains *the one* in itself. For that which is partible giving subsistence to a part by a part, is no longer a whole, nor properly self-subsistent; just as neither is that which moves a part, by a part, properly self-motive [2]. For it is necessary that the properly self-subsistent and self-motive should be without distention, and that the whole should be adapted to the whole of itself. But that which is partible and distended, has its existence alone externally. On this account, therefore, and because it is a composite, and because the whole is not at once that which it is, but has its existence in becoming to be, this is now that which is properly generable, as having an opposite division to that which is properly being, and which has also its existence from itself, and is at once wholly that which it is. Hence, also, it has immediately a mutation and motion from being, because it does not abide in that which is properly being. On this account, likewise, because it does not abide in the same state of perfection; for if it did, it would abide in *the one*, in the same manner as that which is true being; it is changed and moved from its former habitude. Hence too, time runs in conjunction with its flowing essence, measuring and giving a proper position to its departure from real being; just as something else properly disposes the partible division of its essence, and its corporeal nature, whether it be place [3], or whatever else it may be that possesses this power. This, therefore, through the above-mentioned causes, is properly that which is generated. Of this, however, that part of a generated nature which proximately subsists from being, ought itself always to remain in generation, or becoming to be, because true being is immoveable, and has always the same condition according to essence, power, and energy; that which is properly being descending through participation into that which has a flowing existence, or is becoming to be, but that which is eternal descending into the temporal ever, or perpetuity of time. For as the perfection and allness of being subsists wholly at once, that which is generable receives as much as possible partially its infinite power, by a mutation to infinity. Such a thing as this does the much-venerable heaven appear to us to be, viz. the first corporeal nature after the intellectual order, the most beautiful image of the best of paradigms, and a flowing resemblance of real being. The heaven, therefore, being moved immoveably, and changing immutably, has alone those mutations, which can co-exist with that which abides. Hence, it has local motion, for this alone of all mutations in the smallest degree affects the essence and disposition of a thing. It also receives that motion, according to which, though it is locally moved, yet it does not depart from, but is permanently moved in the same place; those bodies that are moved in a right line, not remaining in the same place, for the shortest time. Hence, a circular motion is rather permanency than motion; since the bodies that are moved according to it, after a certain wonderful manner abide in the whole, but revolve in the parts. But the heaven being perpetual, on account of having a proximate subsistence from the immoveable, is superior to the mutation from being into non-being, the former of which is usually called corruption, and the latter generation. For if it were at any time generated, not having existed before, it is necessary that the cause of it should make something which he did not before make, and thus he would no longer be immoveable or immutable, nor would he retain an invariable sameness of subsistence. If the heaven also were to be corrupted, it would depart from the similitude which it has to an immoveable cause, and the cause proximate to it would no longer be a cause, nor would it produce *essentially* [4] things which proximately derive their subsistence from it. But increase and decrease, since they are a certain generation and corruption, are entirely foreign from that which is proximately produced by an immoveable cause. Alliation, however, or change in quality, after a certain manner which will perhaps be hereafter mentioned, may be surveyed in the heaven.

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[2] For the whole of that which is properly self-motive moves the whole.

[3] See the additional notes concerning place, at the end of the Physics.

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[4] The *essential* mode of production which takes place when a thing produces from its very nature or essence, belongs to the first of beings in an eminent degree, and therefore vestiges of it are perceived in the last of things. Hence fire imparts heat, and snow refrigerates essentially; the effect in this mode of production being that *secondarily* which the cause is *primarily*. See the Introduction to my translation of the Parmenides.

The first, therefore, and most perfect of a corporeal existence subsisting after this manner, is also prolific, and not entirely mutable. For though it derives from its fabricator many and blessed prerogatives, as Plato says, in the Politicus, yet it also participates of body, viz. it is distended and partible, and sustains a separation from being. Hence, it is impossible for it to remain without mutation. But changing according to local motion and configurations, and consisting at different times in a different habitude, according to different participations of goodness from its causes, it produces things under it no longer immoveably, as it is itself produced, but gives subsistence to them moveably. Here therefore a mutation according to essence becomes apparent, viz. generation and corruption. But neither is generation entirely from non-being, nor corruption entirely into non-being; so that by changing from one habitude into another they give subsistence to the differences of things which are produced in the sublunary region. Perhaps, however, it may here be more perspicuously said, that intellectual multitude surveyed according to the separation of itself as in the intellectual order, is united, because all true being abides in *the one*. Hence, not only different forms are consubsistent in its essence, but also contraries; and they participate of, and are united to each other, so as that their participation is no longer adventitious. Nor have action and passion any longer a place there. Hence, they are exempt from the above mentioned generation properly so called. But in the first of things which are properly generated, interval, partition, and mutation appearing, yet a pure similitude to the impartible being preserved, the things which give completion to that essence, and the parts and forms are indeed separated from, but nevertheless act upon, and are passive to, each other; as being separated from each other. At the same time, however, the essence remaining, the agents act, and the patients suffer; the energy with respect to each other being of a perfective nature. For the forms in that which is generated, exhibit as in an image, the mutual participation according to union which is in true beings. Hence, things which are produced by these forms, having arrived from the temporal always, to an existence in some part of time, according to the different dispositions of the heavenly bodies, and the sun's existence in different signs of the zodiac, give subsistence to different essences; the heavenly bodies themselves energizing perfectively in the sublunary region. An abundant interval therefore being produced in the last multitude, and in sublunary essences from things thus distended, neither do all things participate of all, nor are all in all, but such things as being different concur in one species, these are able to be consubsistent with each other, and participate of each other without sedition. But contraries sustaining in this region every possible interval, are entirely collected in it, and especially the more generic, such as heat, cold, dryness, moisture, and things concurring with these, i. e. the objects of the several senses, as whiteness, blackness, acuteness, bluntness, sweetness, bitterness, roughness, smoothness, and the contraries belonging to the smell. They are brought together, however, not by themselves, but by the bodies which are their subjects, in which they subsist. But these are the first elements, fire, air, water, and earth, from which other things are composed, as well animals as plants. When, however, certain things becoming harmonized and commensurate with certain things from the celestial bodies, are allotted this collection in one subject, or possess an aptitude to some composite form, then that form shines forth to the view, connects together the concurrence of contraries, and these are connectedly contained by it. But when contraries, such as earth and water, through the natural difficulty of mixture, remain contending with each other, according to their contrary qualities, then it is necessary that one of these prevailing should be increased from the diminution of the other; and that, from such a symmetry of the elements, composite bodies or forms should be naturally adapted to be generated, such, for instance, as the form of an ox or a horse. But from the symmetry of some other form inserted in the elements, according to an excess or diminution of the elements, and other aptitudes, bees are generated from an ox, beetles from a horse[5], and different worms from different animals and plants. Sometimes too, a great excess of some one of the elements taking place, in composite bodies, or the elements themselves becoming weak and old, they are unadapted to the reception of the composite form; then being dissolved, they fall into their proper wholes, and being there renewed and invigorated, they again pass into composition. Water especially manifests this; for it then especially becomes adapted to generation and nutriment, when it is pure, and is divulsed from its proper wholeness, as appears from fountains. And it is evident that generation and corruption here, are certain mutations arising from contraries, and passing from a contrary to a contrary habit. In the elements, indeed, for instance in water, a change being made by fire, into a condition contrary to water, i. e. the fiery, fire is generated; from the contrary, indeed, to water itself, according to contrary qualities, but by the contrary to water, viz. fire. For it is necessary that things which are corrupted should be contrary to that which corrupts them, and that what is generated should be similar to its maker. But the fabrication of the elements is a mutation in itself of agents from patients, the subjects being adapted to either of these; and the corruption again of a contrary is effected from a contrary. For water is corrupted by fire into fire; and, hence the corruption of one thing is the generation of another, and the generation of one thing the corruption of another; the qualities departing into non-being. For when fire is generated from water, the cold and moist quality recedes, the corporeal essence receiving the qualities of fire. And this indeed takes place when from the essence of water a mutation is effected into another essence, viz. that of fire. But when the energy and passive affection of the elements on each other according to qualities, becomes more imbecil, so as to produce a disposition towards each other from themselves, and water still remaining water is heated, then a mutation of water is said to be effected. But when fire still remaining fire is refrigerated or moistened, then a change in the quality of fire is said to be effected; and that which happens is a passion; because one essence is not produced from another, but a change in quality is alone effected. It is also evident, that not any casual disposition is produced from any disposition, but a contrary from a contrary. For that which is refrigerated is not refrigerated by dryness, but by coldness; for that which suffers, suffers from an agent, and from an agent, according to its own nature, and by its very essence; since those things which act according to nature, act in this manner; and the passion which they suffer is such as was the quality of the agent, or according to which the agent makes and energizes. Or it may be said, that the agent naturally and essentially imparts such a passion as was that quality of itself, according to which it acts. For that which energizes naturally wishes to change that which suffers into itself. But a contrary is changed into a contrary; and the heat in that which is refrigerated, is changed into the coldness which is in the refrigeration. But when, as I have said, a change in quality is effected, that which is generated becomes this thing imperfectly; and that which was before hot is refrigerated. It is not, however, so refrigerated as that what is perfectly made cold is changed into the nature of that which imparts the cold, which happens to be the case with things that are generated and corrupted. In short, that which is a contrary energizes and corrupts that thing, wishing and hastening to change it into itself. Thus air, which is supposed to be hot, does not wish with its own heat to change also the heat of fire; for this can also exist in fire; but it wishes to insert moisture in fire; because it is impossible for this to be co-existent with fire. And fire corrupts moisture, not by heat essentially, but by dryness. Heat also accidentally co-energizes with dryness. Hence, therefore, we may syllogize as follows:

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[5] The moderns admitting no other criterion of truth than experiment, know nothing solidly of *parts*, and have no knowledge whatever of *wholes*. Hence, they see not the power of nature herself as a *whole*, and that wherever there is a fit and properly adapted matter, she can produce an animal spontaneously. See more of this in the Introduction to my translation of the History of Animals, and the fourth book of this Dissertation.

Sublunary bodies which energize naturally, energize in consequence of wishing to multiply themselves. Things which energize in order to multiply themselves transmute patients into themselves. But things which transmute patients into themselves, corrupt such things in the patients as are incapable of co-existing with them. Things which are incapable of co-existing are contraries. But contraries are corrupted by contraries. For things which are able to exist together in a common subject, do not corrupt each other. The contraries therefore in the patient being corrupted by the contraries in the agent, the subject receiving the qualities or quantities of the agent, instead of the contraries to them which it before possessed, is changed into the nature of the agent. Hence, that which was before water, from fire becomes fire, through the heat of air, as a medium, and which first, as more energetic, expels coldness from the water, and afterwards moisture through dryness. Magnitudes also, figures, and such things as cannot be coexistent, change into their contraries. And thus the corporeal interval of water, and if there is any thing else in it more material, receiving qualities contrary to those which it possesses, is changed into fire from water, (the common qualities remaining, which are capable of co-existing with each other,) whether a thing of this kind is some corporeal nature in conjunction with certain common properties, or whether it is the first matter. For mutation existing, there must necessarily be something which is permanent, about which the mutation is effected. But this is that which is properly changed according to the departing qualities. Of qualities, therefore, some are corrupted, and others are generated; but the subject is changed according to them. This also not only takes place in generation, but also in alliation. For it has been said respecting this, that when a perfect mutation, according to contrary qualities, of the agent, is not effected, but an accession only of some things from others, as water when it is heated, then the patient does not become another thing, but only different in quality. This, therefore, as I have said, not only takes place in these things, but also in natural increase and diminution. For that which is naturally increased, as that which is nourished, changes and assimilates to itself, the contrary dispositions of the aliment, and thus conjoins them to itself, and is increased. If also the nutritive power has any thing of a psychical nature (i. e. something belonging to soul) yet at the same time, it is thus perfected according to natural mutations. Things, likewise, which are locally moved, change one place for another, that which is moved remaining what it was before. Hence, all sublunary mutation is a revolution, that which is changed being permanent according to something; on which account, things which are generated according to time, are not generated from non-being, but from being. For as of the time according to which these are generated, some other time pre-exists, after which this succeeds, so likewise of that which is generated, something else pre-exists, after which, and from which, that which is generated is generated. Very properly, therefore, does Aristotle consider mutation as the genus of all sublunary revolution in natural things. Very properly also is this mutation perpetual, not only because from the perpetual mutation in the heavens, the mutation according to local motion, and different configurations consist, but because the corruption of one thing is always the generation of another. Very properly, likewise, do simple sublunary bodies remain perpetual in their *wholenesses*, (ταις ὁλοτησι) but sustain generation and corruption in their parts. For if the mutation of things is primarily effected after this manner, and if when dissolved, they naturally tend to their proper places and to their proper wholenesses, but the wholes, in a certain respect, remain, sending forth their parts, and receiving them back again, and this always in consequence of the perpetuity of mutation;—if this be the case, since mutation and generation have an existence, things which are increased and diminished, which are changed in quality, and locally moved, and universally that which sustains mutation, are very properly changed from a contrary habit into a contrary, by a cause contrary to themselves. Hence, Aristotle, in the first book of his Physics, investigating the principles of natural things which are conversant with generation and corruption, says, that they are contraries, and that which is the subject of contraries. And it is evident that things which are generated or corrupted according to qualities, for instance, according to heat or dryness, possessing contrary qualities, are changed from them. Some things indeed are changed according to the mutual change of qualities; but so far as fire, or so far as man, they are essences; and there is no form contrary to essence or substance. Hence with respect to that from which a thing is generated, not as hot or cold, but as man, it is evident that it is generated from that which is not man indeed, but which is naturally adapted to become man; and a thing of this kind is seed, and menstruum. For it will not become man, being already man; since a thing is not generated that which it is. Hence, that which we now call a contrary, according to which a thing not being some particular thing, is naturally adapted to become it, is usually called privation. And a thing is said to be deprived when it has not that form of which it is said to be deprived, but is naturally adapted to have it. Thus a whelp just born, is deprived of sight, because it is naturally adapted to have it; but when it is perfectly blind, it is said to be deprived of sight according to another, and not according to this privation; for the sight in this latter instance, does not return. But generative privation, from which those things which are said to be generated are changed to form, returns to form. Hence, when from being hot any thing becomes cold, it becomes so from that which is not cold, but is naturally adapted to become cold; and on this account it becomes so from the hot. For the dry is not naturally adapted to be changed from the cold into heat, because these two qualities may be co-existent.

If, therefore, that which is generated, is generated from a contrary form, the same subject in the mean time remaining, as the hot from the cold, but this does not pertain to every thing which is generated; for it does not pertain to the first subject, and to essence, since there is no contrary to essence: and if to be generated from that which is not a certain thing, but is naturally adapted to be that thing, pertains to all things which are changed from contrary forms;—if this be the case, Aristotle very properly says, that the common principles of generation are form, privation, and a subject. But he calls form and privation contraries, not according to the proper signification of contrary; for both the things that are properly contraries are forms; but he calls them so according to opposition. For these are opposed to each other.

It is necessary also to remember that the first essence or substance, is neither properly generated from a contrary, nor corrupted into a contrary, because essence is not contrary to essence; but in the first place, it also is generated from its proper privation, and in the next, through the generation of contraries from contraries; and again, it is corrupted through the corruption of contraries. For when the qualities and quantities in the seed and menstruum, are changed into the essences contrary to them, and into which they are naturally adapted to be changed, viz. into those of man, then the form of man is generated. And again, when certain elements exceed, but their contraries being preserved are led to a discordant condition, then the subject is corrupted, but otherwise not.

CHAPTER III.

The next dogma which demands our attention in the physiology of Aristotle is this, that there are not many worlds, or, in modern language, many systems. As his arguments in defence of this dogma possess an invincible force, and are accompanied with his usual pregnant brevity, I shall give them in his own words, accompanied with the luminous commentary of the accurate Simplicius.

"Let us now assign the reason why there cannot be many worlds; for we have said that this must be considered if any one does not think it has been universally demonstrated about bodies, that it is impossible there should be any body beyond this world, but conceives that the assertion only applies to bodies indefinitely situated[6]. All bodies therefore

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[6] Aristotle having shown that there is not a body infinite in magnitude from this, that neither the heavens are infinite, nor the sublunary elements, he consequently began to inquire, whether though the universe is not an infinite body, it may not be of so great a magnitude as that there may be many worlds from it. But then omitting the problem, he was willing, first to investigate universally if there is a natural infinite body, which also he investigated in the

fore abide and are moved, both by violence, and according to nature. According to nature indeed, in that place in which they abide, and to which they tend, without violence; and in that place to which they tend without violence, in that also they abide without violence; but in that place in which they abide with violence, to that also they violently tend; and in that place to which they violently tend, in that also they violently remain. Farther still, if that lation is effected by violence, the lation contrary to this, is according to nature[7]. But if the earth which is there is impelled to the middle which is here, by violence, it will tend thither from hence according to nature; and if it abides here without violence, it also tends hither naturally: for the motion which is according to nature is one[8].

Again,

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the third book of his Physics; and demonstrating that there is not, he at the same time shows, that beyond the heavens there is not any body, neither infinite nor finite, neither imaginable, nor sensible. Then also he used more logical arguments. Again, therefore, demonstrating that neither the body which is moved in a circle is infinite, nor any one of the bodies which are moved in a right line, and concluding that the body of the universe is not infinite, he afterwards discusses the enquiry which he had deferred, viz. whether there may not be many worlds.

[7] Aristotle here, previous to the things to be demonstrated, assumes two axioms; one, that all natural bodies both abide and are moved according to nature, and by violence; that to that in which they abide according to nature, they also tend according to nature; and on the contrary, in that to which they tend according to nature, they abide according to nature. Again, to that in which they abide by violence, they tend by violence; and in that to which they tend by violence, they abide by violence. But the second axiom is, that to the lation which is violent, the contrary to it is according to nature.

[8] Aristotle proposing to demonstrate, that if there are many worlds, they will be similar to each other, and composed from the same bodies, brings this hypothesis to an absurdity, viz. that there will not be one motion, but two motions of each of the simple bodies. For the earth in another world, being of a similar species with the earth which is here, and having the same tendency, which he shortly after demonstrates, if it is moved to the middle of this world, it is either moved by violence and contrary to nature, and will evidently be moved to the middle of the other world according to nature; or it is moved according to nature; for it is admitted, that the contrary to the contrary to nature, is according to nature. To that earth, therefore, there will be two motions according to nature, and contrary to each other, *i. e.* from the middle of this, and to this middle. For the earth there being above this, will in its motion tend from the middle of our world; and having the same tendency with our earth, will tend to the same middle. But if the lation of that earth from thence hither, is not according to nature, it will be according to nature to it, to remain here.

Again, it is necessary that all the worlds should consist of the same bodies, since they are naturally the same. It is also necessary that each of the bodies should possess the same power: as for instance, fire and earth and the elements which subsist between these. For if these are homonymous, and are not predicated according to the same form, as the elements which are here, are predicated by us; the universe also will be homonymously called the world. It is evident, therefore, that one thing among them is naturally adapted to tend from the middle and another to the middle; if all fire is of a similar form, and each of the other elements, in the same manner as the parts of fire which are in this world. But that this must necessarily be the case, is evident from the hypotheses about motions. For motions are finite, and each of the elements is predicated according to each of the motions. Hence if the motions are the same, it is necessary that the elements also should be every where the same. The parts of earth therefore in another world are naturally adapted to be moved to the middle of this world; and the fire which is there to the extremity which is here. This however is impossible. For if this happened, it is necessary that earth should tend upward in its own world, and that fire should tend to the middle. In like manner also, it is necessary that the earth which is here, should naturally tend from the middle, being moved to the middle which is there, in consequence of the worlds being thus posited with reference to each other[9]. For it must either be admitted, that there is not the

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here. For to that to which to tend from hence thither is contrary to nature, to abide here is according to nature. But in that in which any thing abides according to nature, in that it is also moved according to nature. Again, therefore, it will have two natural motions, one from the middle thence, and one to the middle here, which is absurd. This absurdity, however, he omits, but adduces another when he says, *for the motion which is according to nature is one;* as the word *for* evinces, it being a causal conjunction.

[9] Aristotle here in the first place shows, that if there are many worlds, it follows that they will consist of bodies the same in species, and alone differing in number, fire and earth and the middle elements possessing the same powers as here; fire every where possessing heat and levity, and earth, coldness and gravity. But he shows this as follow: Those who say that there are many worlds, say that they are similar to each other, so as to remain the same in species, and to be alone numerically different. If therefore the worlds are naturally similar, they are composed from

the same nature of simple bodies in the many worlds, or those who assert there is, must necessarily make one middle, and also one extremity. This however being absurd, it is impossible that there should be more worlds than one [1]. But to suppose that simple bodies have a different

from bodies specifically the same, and which have the same power, for instance, from fire and earth, and the middle elements, and the body which is moved in a circle; for that is thought to be a world which is composed from these. But if it should be said, that the elements in this world are homonymous to those in another, but not synonimous, and of the same species, it is also necessary that the things composed from them, should no longer be of the same species, as it was supposed they are, but that they should be said to be worlds homonymously. If therefore they are supposed to be of the same species, it is also necessary that the things composed from them should be specifically the same. But if the worlds are homonymous, it is requisite to explain what the nature is of each. Having shown this, therefore, he adds, that which is consequent to the elements in the other worlds being of the same species with those that are here, viz. that in those worlds also, some things are moved from the middle, and others tend to the middle, since fire also and earth are there, and all fire is of the same species with all fire, and in a similar manner each of the other elements; for just as the parts of fire, earth, and the other elements are of the same species with each other in this world, so the elements in the other worlds are of a similar species to the elements in this world. But he shows that one thing in those worlds, viz. fire, is moved from the middle, but another thing, viz. earth, to the middle. The demonstration too is founded on the hypotheses concerning motion, which were pre-assumed by him in the beginning of this treatise, and which he calls hypotheses, as with reference to the things demonstrated from them. In these hypotheses therefore it is shown, that with respect to all simple lation, one is from the middle, another to the middle, and another about the middle, since of the lines according to which motions are produced, two are simple, viz. the right line, and the periphery. It is demonstrated, therefore, that simple motions are definite; that there are two motions in a right line; and that each of the elements receives a specific distinction according to them. Hence, if these alone are simple motions, not only here, but also if there were many worlds, but the elements are not bounded by any other motions, the bodies of the elements will evidently be every where the same.

[1] Having shown the absurdities which attend the hypothesis that there are many worlds composed from bodies of the same nature as that of simple bodies, and having the same motion, and the same middles and extremes, he now shows that those who assert simple bodies to be of the same nature, must necessarily admit that there is one middle and one extreme, each being numerically, and not specifically one. But the motion of things heavy and light, is to the middle and extremity; so that not only the abovementioned absurdities will follow from admitting that there are many worlds, viz. that earth will tend upward, and fire downward, and that each of the simple bodies will naturally have contrary motions, but still more in addition to these absurdities, this absurdity will follow, that simple bodies will no longer be that which they are said to be; for

different nature, if they are more or less distant from their proper places, is irrational. For of what consequence is it to assert that the length of their distance is this or that particular quantity? For they differ according to ratio, by how much the more they are distant, but their form is the same[2]. Besides, it is necessary that there should be some motion of them; for it is evident that they are moved. Shall we say therefore that they are all of them moved by violence, and with contrary motions? But that which in short is not naturally adapted to be moved, cannot be moved even by violence[3]. If therefore there is a certain natural

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for instance, fire will no longer be fire, nor earth be earth. For if the essence and existence of each consists in such a motion according to nature, this motion being changed, the essence of them must also necessarily be changed. If therefore there is one middle, and one extremity, each being numerically one, it is impossible there should be more than one world; for every world must necessarily have a middle, and extremities. Hence it follows, that those who assert that the simple bodies in all the worlds have the same power, must also admit that there is one middle, and one extremity. And this being admitted, it follows that there is one world, and not many worlds.

[2] He here solves a certain objection, which may be made to what has been said, viz. that the earth in another world does not naturally tend to the middle of this world, on account of the great distance. To assign therefore, says he, distances as the cause why bodies lose their proper powers, is absurd. For there is not another nature, that is, another motion naturally, in bodies that are thus simple, if they are more or less distant from their proper places. For what difference does it make in this world for a thing to be distant such or such a length? Perhaps the difference is only this, that when they are moved from a more remote place to their own proper places, the motion is at the beginning weaker; and by how much more the length of the distance is, by so much the weaker is it. But the form or species of the motion, whether the distance be greater or less, remains the same.

[3] That to each of the simple bodies there is a certain natural motion, has been shown in the beginning of the treatise, when it was demonstrated that the motion in a circle belongs to a fifth body, and that the two simple motions in a right line, are the motions of the sublunary elements. He will also speak concerning them in the third book of this treatise. That it is necessary, therefore, there should be a certain *natural* motion of simple bodies, he shows, assuming as evident that all the simple bodies in all the worlds are moved. And because the simple bodies in this world are seen to be moved, and the worlds are supposed to be similar to each other; and because natural especially differ from mathematical bodies, the former being moved, and the latter being immoveable, his reasoning proceeds in effect as follows: The simple bodies in the worlds, since they are moved, are either alone moved according to nature, or they are moved by violence, and contrary to nature. But if they are moved according to nature, we have the thing investigated,

tural motion of these simple bodies, it is necessary that the motion of things of a similar species, and of each of them, should tend to a place which is one in number; for instance, to this particular middle, and to this particular extremity. But if the motion is to things which are the same in species, and these are many, because the individuals also are many, but each of them is without any specific difference, this part will not be of one species, and that of another, but all of them will similarly possess the same species. For all of them are similarly without any specific difference from each other, but any one differs from any other in number. But I say this, because the parts which are here, and the parts in another world, subsist similarly with respect to each other. Hence the part which is assumed here will have no difference when compared with some one of the parts which are in another, and in the same world, but will subsist similarly with reference to all; for they will not at all differ from each other in form[4]. So that it is necessary

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investigated, *i. e.* that it is necessary there should be a certain motion of them according to nature. But if they are moved contrary to nature, with all contrary motions, such for instance, as from the middle, and to the middle, it was easy to show that this is impossible, from what has been admitted. For it was admitted, that the motion which is contrary to the motion that is contrary to nature and violent, is according to nature. But if they are in any respect moved, it is evident that they are naturally adapted to be moved; for to things which are naturally adapted to be moved, there is always a certain natural motion with which they are adapted to be moved. And the reason is wonderful. For every thing contrary to nature, is present together with that which is according to nature; and that which is according to nature not existing, neither will that which is contrary to nature have a subsistence.

[4] Having shown that each of the simple bodies has necessarily a certain natural motion, he consequently shows, that of all those bodies which are of the same species, and of individuals, there is a natural motion to a place numerically one; for instance, to this middle, in this world, and to this extremity, or to the middle and extremities in another world. For if heavy things naturally tend to the middle, they either tend to a middle which is numerically one, or to a middle which is specifically one, but numerically different. It may perhaps be said, that as with respect to things heavy and light, each is one in species, but many in number, so the middle to which heavy things, and the extremity to which light things tend, are each of them one in species, but many in number; and that some things tend to this extremity, but others to others, which are specifically the same with this, but numerically different from each other, in the same manner as the bodies which tend to them.—Thus there will be many worlds, the same in species with

sary either to subvert these hypotheses, or to admit that there is one middle and one extremity. But this being the case, it is necessary that there should be only one heaven, and not many, from these same arguments, and the same necessities. That there is however a certain place to which earth and fire are naturally adapted to tend, is evident from other motions. For in short, that which is moved is changed from something into something; and the terms are *from which*, and *to which*; but they differ in species. All mutation however is finite. Thus that which is restored to health proceeds from disease to health; and that which is increased proceeds from smallness to magnitude. The like therefore takes place in that which is moved. For this proceeds from one place to another. Hence it is necessary that the boundary *from which*, and the boundary *to which* a thing is naturally adapted to be moved, should be specifically different. Thus that which is restored to health, does not proceed any where casually, nor where the mover pleases. Fire and earth therefore are not moved to infinity, but to opposite places. For upward and downward are opposed according to

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with each other, but different in number, and separated from each other. If therefore, says Aristotle, this should be said by any one, we must reply to him, that with respect to that which ranks as a particular, *this* particular will not consist of such and such parts, but *that* of different parts; for a particular clod of earth in another world, is not specifically different from, but similar to a clod in this. For all things according to species, are similarly without difference with respect to each other, though one is different in number from another; not only things here with respect to each other, and in a similar manner things which are there, but also things which are here, with reference to things which are there. And a part of earth or fire which is assumed here, has no difference with respect to the remaining part of the earth that is here, it being specifically the same. In a similar manner, neither has it any difference with respect to the parts in another world. As therefore the parts of earth in this world, being the same in species, but differing in number alone, tend to a middle which is one in number, in a similar manner the parts of earth in another world, which are of the same species with these, and differ from them in number, will tend to this very same middle. For why, since all the parts of this earth are the same in species, but differ in number, do these naturally tend to this middle alone, and not to another, but the parts of another earth, which are specifically the same with the parts of this, but only differ in number from each other, and from the parts of this earth,—why do they no longer tend to this middle, but to another of the same species with this? For if the difference according to number of things which are moved, is the cause of places differing in number, it will be requisite that each of the heavy bodies that are here, and which are alone numerically different, should separately tend to another and another middle.

to place; so that these are the boundaries of lation[5]. For a circular motion also, has in a certain respect the motions which are distant by the diameter, opposites; but to the whole motion nothing is contrary. So that from hence also, motion after a certain manner is to opposites, and things finite[6]. It is necessary therefore, that there should be some end, and that they should not be moved to infinity[7]. But this is an argument that bodies are not moved to infinity, that earth is more swiftly moved as it approaches nearer to the middle, and fire as it approaches nearer to the upward region. If, however, the upward region were infinite, swiftness also would be infinite; and if swiftness, gravity also and levity would be infinite. For as that which tends downward, differing in celerity, is swift through gravity; thus, also, if the addition of this were infinite, the addition likewise of swiftness would be infinite[8].

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[5] Having shown that there is but one world, from their being but one middle, and one extremity, to the former of which heavy things tend, and to the latter light, he now proposes to show that there is something to which earth and fire naturally tend. For this is not being demonstrated, neither according to this argument will it be demonstrated that there is a middle, and an extremity, nor that the world is one. But he demonstrates this by showing, that the upward and the downward are the boundaries of motion. And he demonstrates this by showing, that the motions of them are finite, and are not produced to infinity. This also he demonstrates from all mutation being finite; this, because it is from the definite; this again, because it is from the opposite to the opposite; and lastly this, because it is from that which is different in species, to that which is different. And such is the analysis of the reasoning. But the composition of it is as follows: Things which are locally moved, change from something into something; for while they remain in the same thing, they will not be changed. But that the things from which mutation is effected, and to which it tends, are different in species, and opposite, he shows in the first book of his Physics. For that the intermediate motion proceeding in continuity is produced as from a contrary to a contrary, he first assumes from that which is moved being moved from a different to a different form; since motion from the same to the same form will not be mutation. For that which is changed departs from that from which it changes. But if it is from the opposite to the opposite, and from the definite to the definite; for opposites are definite; it is evident that they are contraries, as being most distant under the same genus. But the *most distant* is definite. And if these are definite, it is evident that they are boundaries; and the motion and mutation produced according to them, are on this account also finite. All mutation therefore is finite. He also appears to remind us of that demonstration which says, it is impossible for any thing to have been moved to any thing, and not to be moved to it from the beginning, because it is impossible for any thing which is moved to come into contact with that which is infinitely distant. And he shows through induction that mutation is effected to finite things. This he evinces in things changed according to alliation, and according to increase and diminution, because the term *from which*, and the term *to which* differ in species, and are bounded and finite. For natural increase and diminution are bounded, and universally mutation according to place; and that which is beyond, is now contrary to nature. But as in things which change according to quantity and quality, the mutation is from one boundary to another, and the terms *in which*, and *to which* are specifically different, are contraries, definite, and boundaries, thus also in things which change according to place, the local differences of the bodies which are naturally moved, viz. the upward and the downward, being specifically separated, are contraries, definite, and boundaries. These, therefore are natural to fire and earth. Hence there is something to which earth and fire naturally tend, viz. the upward and the downward. But these are not casual situations, nor where the mover pleases. For he who is restored to health, if in short he is restored to health, though he by whom he is restored should not be willing, changes into health, or he would not be restored to it.

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[6] Aristotle having said, that mutation according to place is from an opposite to an opposite, viz. is according to a right line, for this is properly lation, adds, that the motion in a circle also, though it is not simply *lation*, but *circulation*, yet has in a certain respect opposites according to the diameter. But if it should be doubted why Aristotle having before demonstrated through many arguments, that there is not any lation contrary to the lation in a circle, and having also shown that the motions which are opposite to each other according to the diameter, are not opposed as opposites in the circle, but as moved according to the diameter, now, as if he had altered his opinion, says, *that a circular motion also, has in a certain respect the motions which are distant by the diameter opposite;*—should this be doubted, in the first place, let him who makes the doubt attend to the accurary of Aristotle. For he does not simply say, that a circular motion has opposite motions, but that it has *in a certain respect* opposites; since the motions of bodies to contrary places are properly said to be opposed to each other. And contraries are those which are most distant from each other. But things which are moved in a circle, are neither moved to the place according to the diameter, as to the end, but they are moved from the same to the same, nor is the motion according to the diameter the *most* distant to that which is moved in a circle. For *most* is that which does not receive an addition. But after the distance according to the diameter, the motion and the distance still receive an addition, till the restitution to the same point; for the distance from any given point continually increases till the restitution to that point. Aristotle also having very accurately said, that *a circular motion has in a certain respect the motions which are distant by the diameter opposites*, adds, *but to the whole motion nothing is contrary;* for the very colour itself of opposition which there appears to be, is in the parts of the motion in a circle, and not in the whole. And in the parts indeed, it has not properly a subsistence; since motions which are properly opposite are interrupted by rest. And when things which are moved naturally with opposite motions become one and the same, the one is moved contrary, but the other according to nature. But things moved in a circle, neither stand still when they arrive at the diameter, for they are not moved according to it, nor are they moved in one of the semicircles according, but in the other contrary to nature.

[7] Having shown that the motion in a circle, and especially that the motion in a right line (for his argument required these, in order to show that there is one middle and one extremity) are not produced to infinity, but terminate in opposites, things definite and finite, and having added, that the motion in a circle has in a certain respect, opposites, he now concludes, that it is necessary

Neither

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cessary there should be a certain end, and that bodies which are moved, should not be moved to infinity. But if this be the case, there is something to which earth, and something to which fire are naturally adapted to tend. And if this be admitted, there is one middle, and one extremity. The motion in a circle also, though it should not be interrupted, but should continue to infinity, would not be such an infinite, as that of the motion in a right line in which the body that is moved is always in another and another place. But the motion in a circle is always in the end, as it is also always in the beginning.

[8] That the upward and downward are definite, and that bodies which are moved in a right line are not moved to infinity, Aristotle adduces this as an argument, that earth by how much nearer it becomes to the middle, is moved by so much the swifter, and that fire is moved by so much the swifter, by how much the nearer it approaches to the upward region. For if the upward and downward were not definite, but the distance was infinite, and the end was not determined, there would always be an addition to the velocity to infinity. If, therefore, velocity is produced, on account of natural tendencies, and some things are moved upward, on account of having more levity, but others downward, in consequence of having more gravity, it is evident that gravity and levity existing inwardly, as natural powers, will receive an infinite addition. It is not, however, necessary, says Alexander, to fancy, if this be the case, that the bodies which are moved will be infinite, but that they will receive an addition to infinity. For it is impossible that the proper power of a finite body which does not always receive an addition, should be increased to infinity. Simplicius farther observes, that Aristotle omits to add, perhaps because it is easy to be understood, that if heavy bodies when they become near to that place which is downward, and light bodies when they become near to that which is upward, are moved more swiftly, it is evident that these places are natural to them; for they would be moved in a contrary manner to the opposites of these. That bodies, therefore, are moved more swiftly when they are nearer to their proper places, appears to be universally admitted. But a different cause of this is assigned by different ancient writers. For Aristotle thought that the nearer they approach to their proper wholenesses the more they become corroborated by them, and receive a more perfect form; for the addition of gravity causes earth to tend more swiftly to the middle. But Hipparchus, in his treatise inscribed, Concerning things which tend downward through gravity, says, that when earth is thrown upward, the power which throws it, as long as it is superior to the power of the earth which is thrown, is the cause of its motion upward; and by how much the more its force is superior, by so much the more swiftly is the earth moved upward. But when this force is diminished, in the first place, it is no longer moved upward with a similar velocity, and at length is moved downward, this being its proper tendency, and the power in a certain respect remaining

Neither will one of these be moved upward, and the other downward, by something else, nor by violence, as some say, through impulsion; for fire would be moved more slowly upward, and earth more slowly downward. But now, on the contrary, fire and earth are always moved more swiftly to their proper places. Nor would any thing be moved more swiftly near the end, if it were moved by violence and impulse; for all things which are moved to a greater distance by violence, are moved more slowly; and to that place from which they are impelled by violence, they tend without violence. So that from the contemplation of these things, faith about what is now said may be sufficiently obtained[9]. Farther still, by arguments derived from the first

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ing which threw it upward. This power, however, becoming weaker, that which is moved downward is always moved with a greater velocity, and with the greatest velocity, when the power that threw it entirely fails. He also assigns the same cause of things which are moved from the upward to the downward; for in these also the power which causes them to fall remains for a certain time, and the power of the falling body being contrary to this, is the cause why the falling body is moved more slowly at the beginning. Alexander, however, well observes, that in bodies which either are moved from, or remain in a place contrary to, nature, what Hipparchus says is true; but in those things which after they are generated tend to a place adapted to them, according to their own proper nature, can no longer be admitted.

Others again, and those not a few, Simplicius adds, say, that the reason why bodies which are moved downward, are moved with greater velocity, by how much the nearer they approach to the downward place, is because bodies the higher they are, have a greater quantity of air under them, which is diminished in proportion as they draw nearer to the surface of the earth. Hence they say, that more heavy bodies are moved more swiftly, because they more easily divide the air beneath them; and that by how much the greater the quantity of air is which is under them, by so much the lighter will they seem; just as it happens to bodies that are moved downward in water. In a similar manner also a greater quantity of fire will more rapidly tend upward, because it more easily divides the air which is above it; and by how much greater the quantity of the air above is, by so much the slower will that be moved which passes through it. For though air is not naturally adapted to subsist similar to water, yet at the same time, being a body, it impedes the motion of the bodies moved through it. But if this be true, the increase in the velocity of falling bodies, will not arise from the addition of gravity, as Aristotle says, but from the removal of the impediment.

[9] Aristotle, in order to show that there is one world or universe, having employed this as an argument, that there is one middle and one extremity, and having shown this from the natural motions of bodies being directed to something bounded and finite, to which they are adapted to tend, and having also inferred this from bodies being moved more swiftly when they draw near to

first philosophy, and from a circular motion, which must from necessity be similarly perpetual in this and other worlds, this also may be demonstrated[g]. It likewise will become evident that there is necessarily one heaven, from considering as follows: For as there are three corporeal elements, there will also be three places of the elements; one indeed being the place of the body which subsists under the others, and which is situated about the middle; another being the place of that body which is circularly moved, and which is the extreme; and the

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to their proper places, now shows that those motions of bodies are produced according to nature, which just before, and in what preceded, he had frequently used. But he demonstrates this from the subversion of the opposite positions. For elementary bodies are either moved according to their own nature, or from being extruded by each other, or moved by something else. He shows, therefore, that they are neither moved by something else, nor extruded by each other. And he demonstrates the first of these from this, that a greater quantity of fire is moved more swiftly than a less, and also a greater clod of earth than a less; though if they were not naturally adapted to be thus moved, but were violently moved by something else, the greater quantity would be more slowly moved by the same thing. For the less quantity is more easily impelled and removed. But to say that the greater quantity, being moved by a multiple power, is moved with a greater velocity, resembles a fiction. For it is not always necessary that the more should be moved by the more. And this is evident from opposite motion; for a greater quantity of fire is more slowly drawn downward. But he consequently shows that they are not moved through being extruded by each other. Posterior to Aristotle, also, Straton and Epicurus, were of this opinion, thinking that every body has gravity, and tends to the middle; and that in consequence of more heavy bodies subsiding, those that are less heavy, are by them thrust violently upward. Hence, if any one could remove the earth, water would come to the centre; air, if water were removed; and fire, according to them, if air were removed. Simplicius adds, that not only Straton and Epicurus asserted, that all bodies are heavy, and naturally tend downward, but are moved upward contrary to nature, but Plato also knew and confutes this opinion in his Timæus.

[g] Aristotle calls *arguments derived from the first philophsoy*, those which he has employed in his Metaphysics; and he says, that from what is there asserted, and also from what is delivered in the eighth book of the Physics, it is shown that there is one world. For in the eighth book of the Physics indeed, it is demonstrated concerning the motion in a circle, that it is perpetual wherever it may be, whether in this world, or in some other; and that it is moved by an immoveable cause, which is also demonstrated to be incorporeal and impartible. But it is demonstrated to be so, because there is no infinite body, and because nothing finite has an infinite power; but there is an infinite power in that which moves to infinity. Simplicius also justly observes, that if there are many moving causes, as there are, viz. (the divine intellects of the starry spheres), and one first cause of all of them, it is also necessary that there should be one co-

the third which is between these, and is the place of the intermediate body. For in this place it is necessary that the body which surpasses in levity should be situated; since if it were not in this, it would be situated beyond. This, however, is impossible. For one body is without, and another possesses, gravity. But the place of the body which possesses gravity is more downward; if that which is in the middle is heavy. Neither is it in this place contrary to nature; for if it were it would be in another place according to nature. But it is not in another. It is necessarily, therefore, in the intermediate place. What the differences are, however, of this intermediate place, we shall afterwards explain. Concerning the corporeal elements, therefore, what, and how many they are, what the place is of each, and, in short, how many the places of them are in multitude, is manifest from what has been said [3]."

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ordination of all of them to their one cause, and one intellectual world, from which, and with reference to which, the sensible world subsisting, is itself generated one, from things containing and contained, in the same manner as the intelligible world is one. And if those who assert that there are many worlds, collect them into one co-ordination, so as that one thing is produced from all of them, some being more total, but others more partial, and some containing, but others being contained, they must consequently assert that this is one world, composed from many worlds. For each of the celestial and sublunary spheres is a world. Thus the earth, water, air, and æther, are each of them a world; and on this account this world is one whole, as Plato says, composed from all wholes.

[3] The remainder of the argument employed by Aristotle to show that there is one world, is this, that the natural place of each of the elements is one in number. The problem, therefore, being pre-arranged, to which the things demonstrated refer, viz. that there is necessarily one world, he consequently shows, that the natural place of each of the elements is one in number, as follows: As many differences as there are of the corporeal elements from which the world is composed, according to the local motion of them, so many differences of places must there necessarily be in the world. As, therefore, speaking with reference to genus, there are three corporeal elements, there will also be three places; one, that of the heaviest body, which subsists under all the others, and which is ranged about the middle; another, at the extremity of the universe, and which is the place of the body moved in a circle, and comprehending in itself all bodies; and the third, the place of that which is intermediate, and which receives a manifold division. For it is divided into that which is light, and emerges above all the other elements, viz. fire; and into the elements between this and the heaviest body, viz. air and water. But that these places are in this, and not in another world, he demonstrates, in one of the elements, viz. fire; just as before he demonstrated in earth. For it is necessary that the element which emerges above all the rest, should either be in this intermediate place, or out of the place in which it is situated.

CHAPTER IV.

The next admirable dogma of Aristotle is this, that beyond the heavens there is not any body, nor any time or place, but that the beings which exist there are impassive and eternal, and possess the most excellent and self-sufficient life. On this subject, therefore, he writes as follows in his first book On the Heavens.

"Let us in the first place explain what we say heaven is, and in how many ways, that the object of investigation may become more manifest to us. In one way, therefore, we call heaven the essence of the ultimate circulation of the universe; or that natural body which exists in the ultimate circulation of the universe. For we are accustomed to call that which is last and especially on high, heaven, in which we say every thing divine is established. In another way we call heaven the body which is in continuity with the ultimate circulation of the universe, in which the sun and moon, and some of the stars are contained. For we say that these are in the heaven. Again, in another way we call heaven the body which is comprehended by the last circulation. For we are accustomed to call the whole and the universe heaven. Since, therefore, heaven is triply denominated, the whole which is comprehended by the last circulation, must necessarily be composed from every natural and sensible body, because neither is there any body beyond the heaven, nor can any body be generated beyond it[4]. For if there is a natural body beyond the last circulation, it must necessarily either be one of simple or of composite bodies, and must either subsist according to or contrary to nature. It will not therefore be any one of simple bodies. For it has been shown that the body which is moved in a circle, cannot change its place. But neither can it be that body which is moved from the middle; nor that which is placed under all the rest. For they would not exist there naturally; since their proper places are different from this. But if they are there contrary to nature, the external place will be natural to some other body. For it is necessary that the place which is contrary to nature to this, should be natural to some other body. There is not however any other body besides these.

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[4] The heaven, says Aristotle, is triply denominated. For we call the inerratic sphere heaven by way of eminence, which he describes in a two-fold respect, calling it *the essence of the ultimate circulation of the universe*, or *that natural body which exists in the ultimate circulation of the universe*; assuming a natural body instead of an essence which is more common, this being nearer to the proposed genus. But how do we say that every thing divine is established in the inerratic sphere, since we also conceive the planets to be divine? May we not say, that this is because the summit is every where ascribed to a divine nature, and that conceiving the whole of the heaven to be divine, we characterize it according to its summit? Our conversion also to divinity tending upward,

upward, proceeds as far as to that which is highest. Or is it because all the divine essences being separately united to the first principle, and having in their own proper nature a supermundane subsistence, are especially comprehended by the first and most excellent of bodies? The second signification of heaven, says Aristotle, is that according to which we call the planetary sphere heaven. For this is the body which is in continuity with, or proximate to, the ultimate circulation of the universe, in which the sun and moon, and the other stars which are called planets, are contained. But delivering to us a divided appellation of the inerratic and the erratic sphere, he gives us to understand that we denominate heaven, every thing which is moved in a circle and is extreme, and which is divided in opposition to a generable and corruptible nature. The third signification of heaven, says he, is the body which is comprehended by the last circulation, viz. together with the last circulation. For we are accustomed, says he, to call the whole and the universe heaven, so as that the thing which is contained is assumed together with that which contains; and according to this signification, the whole world is called heaven. This appellation was also given to the world by philosophers prior to Aristotle. For in many places Plato calls the world heaven, as in the Politicus and the Timæus. But the world is called heaven, because it is well that it should be so denominated according to the most principal of its parts. Thus man is denominated according to soul, and the rational part of the soul ανθρωπος, from το αναθρειν, i. e. *considering what he sees, and collecting many things into one.* For man alone of all terrestrial animals revolving things which proceed from many senses, collects them into one. But the reader who understands the etymology of the name of heaven, given by Plato in the Cratylus, viz. that *it is sight directed to things above,* as converting the causes of itself to itself, and abiding in them, will readily admit that the world should be called heaven, being suspended from the causes of its existence. The heaven, therefore, being triply denominated, this third signification is that according to which the world is called heaven. And this, says Aristotle, is *necessarily composed from every natural and sensible body.* He also adds the cause, viz. *that there neither is any body beyond the heaven, nor can any body be generated beyond it.* For if there is no body beyond i[illegible] it will evidently consist of every corporeal nature.

It is not possible, therefore, that there can be any simple body beyond the heavens. But if no simple, neither can any mixt body be there; for mixt body existing, it is also necessary that there should be simple bodies[5]. Neither is it possible that any body can be generated beyond the world. For it will either be generated according to, or contrary to nature; and will be either simple or mixed: so that the same reasoning will again take place. For it makes no difference, whether we consider if it is, or if it is possible for it to be generated. Hence, from what has been said it is evident, that neither the bulk of any body is, or can be produced beyond the heavens. For the whole world is composed from all its proper matter; since the matter of it is a natural and sensible body. Hence, there neither now are many worlds, nor were, nor can be produced; but this world is one, alone, and perfect[6]. At the same time likewise it is evident, that beyond the heavens there is neither place, nor a vacuum, nor time. For in every place it is possible for body to exist; and they say a vacuum is that in which body is not, but in which it may exist. But time is the number of motion; and motion is not without a natural body. It has however been shown, that beyond the heavens there neither is nor can be any body. It is evident therefore that there is neither place, nor a vacuum, nor time beyond the heavens[7]. Hence neither are the beings which are there naturally adapted

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[5] If there is any body beyond the ultimate heaven, it must necessarily either be simple or composite. But simple bodies, as has been demonstrated from simple motions, are, the body which is moved in a circle, and the body which is moved from the middle in a right line, viz. which is light, and tending upward, and the body which in a right line tends to the middle, and is heavy and subsides. It has however been shown before, that there is one middle and one extremity. But the extremity is the body which is moved in a circle. Hence, beyond the extremity, there will not be any other body which is moved in a circle. But that there is neither any heavy nor light body, nor in short, any body that is moved in a right line, beyond the heaven, he shows, by again employing an appropriate mode of demonstration. For if there is any such body beyond the heaven, it is either contrary to, or according to nature; for in both these ways, things are naturally adapted to be in place. For it has been shown that those bodies naturally abide in that place in this world, to which they naturally tend; since it has been demonstrated that there is one middle, and one extremity. And if it should be said that a certain body which is moved in a right line, is there contrary to nature, those places will evidently be the places of other bodies according to nature. For that which is contrary to nature to one thing, is according to nature to another. There is however no other simple body besides these. But if there cannot be any simple body beyond this heaven, neither can there be any mixed body; for mixed are composed from simple bodies; and mixed bodies existing, it is also necessary that there should be simple bodies.

[6] Aristotle appears to assign this as a cause of their being no body beyond the heaven, either simple or composite, viz. that the whole world is composed from the whole of matter. For though these two things follow each other, viz. to be composed from the whole of matter, and for nothing to be left beyond the world, yet at the same time, the being composed from the whole

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whole of matter appears to be the cause of nothing remaining beyond the world. For defining the all or the universe, we say it is that to which nothing is wanting. But Aristotle well observes, that *it makes no difference whether we consider if it is, or if it is possible for it to be generated.* For things which may be generated, and especially natural things, when there is no impediment, will be generated, or they would have the power of being generated, in vain. But things which may be produced according to deliberate choice, may frequently not be generated, the intention being altered, or by some means or other impeded.

[7] Having shown that there is no body beyond the heaven, from this he shows that neither time nor place are there, concluding in the second figure as follows: In every place there may be body. Beyond the heaven it is impossible for body to exist. Beyond the heaven therefore there is no place. And again: If a vacuum is that in which a body is not, but in which it may exist, but beyond the heaven there not only is not a body, but neither is it possible for any body to exist; beyond the heaven there is not a vacuum. And again, in the third place: Time being the number of motion, is always there where motion is. But motion is there where the body is which is moved. If therefore time is where body is, but beyond the heaven, there neither is nor can be any body, there neither is nor can be any time beyond the heaven. Simplicius adds, that the Stoics being of opinion that there is a vacuum beyond the heaven, attempt to prove that there is through the following hyhothesis *. Let it be supposed that some one standing on the extremity of the inerratic sphere extends his hand upward. And if he extends his hand indeed, they assume that there is something beyond the heaven to which he extends his hand. But if he cannot extend it, thus also there will be something beyond which prevents the extension of his hand. And if again standing on the extremity of that something which impedes, he extends his hand, there will be the same enquiry as before. For it may be shown that there will be something beyond it. To this, however, Simplicius justly replies, that if the world is *the all*, and there is nothing beyond the all, the hypothesis is just as if some one should attempt to extend his hand into non-being. For if he should extend it, there will be some place which receives it, and

* The Epicurean poet Lucretius, also endeavours to prove that there is an infinite vacuum by an hypothesis which differs from the above only in this, that instead of a man extending his hand, he supposes him to throw a dart. Vid. Lib. I. De rerum natura.

adapted to be in place, nor does time cause them to become old, nor do the natures which are arranged above the outermost lation, experience any mutation; but they are unchanged in quality, and impassive,

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and thus it will no longer be non-being. But if he cannot extend it, there will be some place which impedes. The hypothesis therefore and object of enquiry pre-assumes in the phantasy that there is something beyond the universe, either a solid or a vacuum. But even from the vacuum, says Alexander, which they suppose, they subvert the existence of a vacuum. For if there may be a vacuum beyond the world, this vacuum must be either finite or infinite. But if finite, it is bounded by something; and again, the same enquiry may be made about the bound of the vacuum; for some one may either extend, or nor extend his hand. But if the vacuum is infinite, as it appeared to be to Chrysippus, and a vacuum is space capable of receiving body, but does not receive it; and if of relatives it is necessary that when one of them is, the other also should have an existence, if there is that which is capable of receiving, there will also be that which is capable of being received, or which may exist. Neither however do they say that there is a body, nor is there an infinite body which can be received by an infinite vacuum. Alexander also justly accuses those who are guided by the imagination of an extended hand, and who fancy therefore that what is said of it is true. For we have, saye he, an imagination of many things that are impossible. Thus a man may fancy himself out of the city when he is in it, or that his body is of any indefinite dimension, whether large or small. But Plato assigns two causes why there is but one world, one of which is the paradigmatic cause. For in the Timæus he says, In order that the world according to the monadic might be similar to all-perfect animal, (*i. e.* animal-itself (*αυτοζωου*) the extremity of the intelligible triad) the demiurgus neither generated two, nor infinite worlds, but this heaven, or world, is and will be one, and only-begotten. For if there were another world, it would not be perfect in sensibles, as its paradigm is in intelligibles; just as a little prior to this, he endeavoured to demonstrate, that there is always one image of one paradigm, to which the image is proximately and properly assimilated. But the other cause which Plato assigns of there being but one world, is that which Aristotle also assumes, viz. that it is composed from every corporeal nature. Simplicius farther adds, but that in these things also the concord between Aristotle and his preceptor may be apparent, even without any variation in the words themselves; I will add the words of Plato in the Timæus: "Of these four elements, the demiurgus assumed one whole from each, in order to the composition of the world. From all fire, therefore, air, water, and earth, it was constituted by its composing artificer, who left no part nor power of any thing beyond it. For in the first place, he dianoëtically conceived that the whole, because it is especially perfect, should also consist of perfect parts; in the next place, that it should be one, in consequence of nothing being left from which any thing else of a similar kind could be generated; and farther still, that it should not be subject to old age and disease." A little after also he adds, "Through this cause and this reasoning energy, the demiurgus constituted the world one whole from wholes, in all things perfect, and free from old age and disease." These things also are asserted by Aristotle when he says, that the world being composed from all sensible matter, is *one*, *alone*, and *perfect*.

possessing through all eternity the most excellent and self-sufficient life. For this name is divinely enunciated by the ancients; since the end which comprehends the time of the life of every thing, and of which nothing is naturally external, is denominated the eternity of every thing. For the same reason also, the end of the whole heaven, and the end which comprehends the infinite time and infinity of all things is eternity, deriving its appellation from being always, and is therefore immortal and divine. Hence also the being and life of other things are suspended from this, of some more accurately, and of others more obscurely. For as from the more popular discussions about divine natures it evidently appears that every thing divine, and which is first and highest, is necessarily immutable; that which thus subsists, bears witness to what is said. For neither is any thing else which is motive more excellent; since if it were it would be more divine. Nor has it any thing depraved, nor is it indigent of any good of its own. Reasonably also is it moved with an unceasing motion. For all things cease to be moved when they arrive at their proper place; but of the body which is moved in a circle, the place is the same whence it began, and in which it ends[8]."

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[8] According to Alexander, what is here asserted, is either said about the first mover, which appears to be beyond all body, as not subsisting in any, and which is not in place, as being incorporeal; or it is said about the inerratic sphere. And he rather conceives that all that is said as far as to the words, "*But of the body which is moved in a circle, the place is the same whence it began, and in which it ends,*" pertains to this sphere. For Aristotle demonstrates in the Physics, that it is not in place; since place is the boundary of that which contains, but the inerratic sphere is not contained by any other body. Those things also which are contained by time, are in time, as subsisting in a part of it. If therefore there is neither any body beyond it, nor time contains it, it will neither be in place, nor will it become old through time. This also accords with what is said by Plato in the Timæus. But if, says Alexander, by *that which is above the outermost circulation*, Aristotle alludes to the first cause, he will speak about that which is above the circulation of the inerratic sphere. But if he asserts this of a divine body, he will call the last lation, the last of the motions in a right line; for he usually calls the motion in a right line, lation, but a circular motion circulation. The body therefore which is moved in a circle being above the perpetual lation of the sublunary elements, is neither in place, nor in time, being perpetual, and free from the incursions of old age. For the whole of the divine body of the outermost

CHAPTER V.

We have already seen that Aristotle, at the end of his Physics, demonstrates the perpetuity of the world from the infinite nature of time. In

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most sphere is not in place; but its parts, the spheres of the planets, are in place. But when Aristotle says, that the natures beyond the heaven possess through all eternity the most excellent and self-sufficient life, he wishes to assume immortality and perpetuity from the whole of the perpetual, and from the name of eternity. And first distinctly evolving the more gross signification of eternity, from this he returns to the proper meaning of it. For we call the eternity of every thing, the perfection which comprehends the time of every thing, beyond which there is nothing according to nature. But Aristotle says Alexander denominates as a more proper eternity, the wholeness and the perfection of all heaven co-extended with infinite time. For this justly receiving its appellation from being always, is immortal and divine. It is also the cause of immortality and perpetuity to the natures which proximately and properly participate of it; possessing and comprehending in itself the whole of time. But to other things it imparts a partial extension of life; for all things derive from it their being and life, some more accurately, and others more obscurely. Aristotle however prior to this eternity which is co-extended with infinite time, knew that eternity which subsists as the power of the first intellect according to him, and which Plato says, is the paradigm of time. For in the Timæus he says, that the demiurgus generated time, as an eternal image flowing according to number of eternity abiding in one. But Aristotle says that the being of all things is suspended from the celestial perpetuity, because the motion of it is the cause of existence to every thing in generation. He also says, it is evident from more popular discussions, that the divine nature is perpetual; for in these it is said that every thing divine, and which is first and highest, is necessarily immutable. For if immutable, it is also eternal. But, Simplicius adds, he calls *popular discussions,* those doctrines which in an orderly series from the beginning are delivered to the multitude, and which he is accustomed to denominate *exoteric;* just as he calls doctrines which require greater study *acroamatic,* and *syntagmatic.* But he speaks concerning these in his treatise *On Philosophy* *. For universally in those things in which there is something *better,* there is also that which is most excellent. Since therefore in the order of beings, one being is better than another, there is also among them something which is most excellent, and which also will be divine. If therefore any thing is changed, it is either changed by something else, or by itself; and if by something else, either by that which is better, or by that which is worse than itself; but if by itself, it is in

* This work is unfortunately lost.

In the first book of his treatise on the Heavens also, he shows multifariously that the heavens, and, on account of them, the whole world, are

consequence of aspiring after either that which is superior, or that which is subordinate to itself. But the divine nature has neither any thing better by which it can be changed; for that other thing would be more divine than it; nor can that which is essentially more excellent suffer any thing from that which is essentially subordinate. Neither can it be changed by itself, as desiring something better than itself; nor as desiring something worse, since neither does man voluntarily make himself worse; nor has the divine nature any thing depraved which it may receive from a mutation to that which is worse.

Simplicius farther observes, that Aristotle derived this demonstration from the second book of the Republic of Plato. For Plato there says, "It is necessary therefore, if any thing departs from the idea of itself, that it should either through itself depart from itself, or through something else. Things however which subsist in the most excellent manner, will by no means be changed and moved by any thing else, as the body is by meat, and drink, and labour." Afterwards having demonstrated this, he adds, "But perhaps it will itself change and alter itself. Whether therefore will it change itself to that which is better and more beautiful, or to that which is worse and more deformed than itself? But if it suffers any alteration, it is changed to that which is worse; for we certainly must not say that God is in want of beauty or virtue." Having shown also that no one willingly makes himself worse, he adds, "But as it seems each of the divinities being as much as possible most beautiful and most excellent, simply remains in his own form." Aristotle also says, *reasonably is it moved with an unceasing motion;* for all things which are naturally moved, when they arrive at their proper from a foreign place, rest; and the beginning of motion to them is in a foreign place, but the end when they become situated in their proper place. But of the body which is moved in a circle, the same place is the beginning and end of motion; and because it is always in the end, it is always in its proper place, and in its proper good; but because it is always in the beginning, it has an unceasing motion; for nothing ceases in the beginning. Simplicius adds, all that I have said from the beginning to the end of the text, Alexander rather conceives should be understood of the body which is moved in a circle; but later interpreters are of opinion that all that has been said should be understood of the immoveable causes which move the celestial orbs. And indeed that it is not possible the whole of the present text can be referable to a celestial body is evident from what was said just before. For Aristotle having shown that there is no body beyond the heaven, he concludes, it is evident therefore, that there is neither place, nor time, nor a vacuum beyond the heaven; and then he adds, as a certain corollary from what has been said, "*hence, neither are the beings which are there naturally adapted to be in place, nor does time cause them to become old, &c.*" And it is evident indeed, that by *the beings which are there*, he means the beings beyond the heaven: for how can the heaven be said to be beyond the heaven? And how can it be said that no one of the celestial orbs has any mutation whatever, when their unceasing local motion is surveyed? In short, how can heaven be said to be the *first and highest divine nature?* Or how is it possible *that* should not be something better than the heaven, which moves it? Since an immoveable are ingenerable and incorruptible, and are neither generable but incorruptible, as some appear to have said, nor ingenerable but corruptible, but

able cause is better than perpetual motion, in consequence of being the cause of it. But that all that is here said by Aristotle may be understood of intelligible causes is evident from the words, "For the same reason also the end of the whole heaven," and still more from what is said in the end, which show that the heaven is reasonably moved with an unceasing motion. That what is said, however, is obscure is evident; for otherwise there could not be any dissonance among wise men about it. Perhaps, however, what is said pertains to intelligibles as subsisting above, as being exempt from, a corporeal nature, and on this account are said to be beyond the heaven. For when he enquired if there is any thing beyond the heaven, he did not speak as if by the term *beyond* he intended to signify *place*. But delivering the signification of *the eternity which is proximate* * *to us*, and which comprehends the time of the life of every thing, he proceeds from that to the *celestial eternity*, which is implied by the words, *for the same reason also the end of the whole heaven:* and on this account he now makes mention of the heaven. Afterwards he ascends from this to the supermundane eternity, when he says, "*the end which comprehends the infinite time, and the infinity of all things is eternity*; and also when he says, that this is the most principal eternity from which more accurate being and life are derived to celestial, but more imbecil to sublunary natures. When he also testifies that *every thing divine, and which is first and highest is necessarily immutable*, he appears to speak about the intellectual and immoveable principles, which move the celestial spheres. For that he speaks about *many* is evident from the words *every thing divine, and which is first and highest*. The words also, "*for neither is any thing else which is motive more excellent*," are more adapted to an intellectual and immoveable principle than to the heaven. For the cause which moves the heaven being immoveable, is better than it. And if this is said of intelligibles, it is evident that there is not any mutation of any one of the natures which are arranged above the outermost lation. But the words, "*reasonably also is it moved with an unceasing motion*," are evidently asserted of the heaven, if this reading be adopted; and they appear to harmonize with the preceding, as asserted of the same thing. But if, Simplicius adds, the reading is adopted which is found in some copies, viz. "*reasonably also it moves* (κινει) *an unceasing motion*;" and not, "*it is moved with*," (κινειται), which Alexander adopts, it is possible according to this to refer all that precedes in the text, without any violence, to intelligible and immoveable causes, and which, as being supermundane, are said to be beyond the world. For because they are immutable and immoveable, on this account the celestial orbs which are proximately moved by them, are moved with an unceasing motion. For that which but that they possess perpetuity from each part; and universally that the generable and corruptible, and the ingenerable and incorruptible, follow each other. Having, therefore, copiously demonstrated these things in the first book, he makes the conclusion of them the beginning of the second book, in the following admirable manner.

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* Eternity, according to the most beautiful and profound definition of Plotinus, is *infinite life, at once total and full*. As there are many processions of life therefore, viz. *intelligible*, *intellectual*, *supermundane*, and *mundane*, so likewise there are many processions or orders of eternity, in all of which its characterestic property is preserved. For as eternity is that which imparts *stability of being*, some things possess this stability both in their essence and energies, but others in their essence alone. Thus intellect is eternal both in essence and energy, but soul is eternal in essence, and temporal in energy.

"That all heaven, therefore, was neither generated, nor can be corrupted, as some say, but that it is one and perpetual, having no beginning nor end of all eternity, but possessing and comprehending in itself infinite time, may be believed from what has been said, and through the opinion of those who speak otherwise, and assert it to be generated. For if it can thus subsist, but cannot subsist after the manner which they adduce, this will have great weight in procuring credibility concerning its immortality and perpetuity[9]. Hence it will be well

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moves always possessing an invariable sameness of subsistence, that which is proximately moved by it, being conjoined with it, through the highest aptitude, is also necessarily moved. But the motion in a circle is demonstrated to be continual in the eighth book of the Physics. Because, however, the heaven is circularly moved, converting itself to intellect, and aspiring after its sameness, and participating of its invariable energy; on this account it is moved with an unceasing motion. For bodies which are moved in a right line, having the beginning of their motion different from the end, are moved indeed from the beginning, but cease to be moved at the end, and when they arrive at their proper places. But of the body which is moved in a circle, since the place is the same whence it begins, and in which it ends its motion; because it is always in the end, it is always in its proper end; and because it is always in the beginning, it is always moved to the end.

[9] When Aristotle says that the heaven has no beginning nor end of all eternity, he means the temporal extension of life; for the eternity of every thing connected with time is said to be this. And this indeed is a certain image of that which is properly eternity, so far as it is a conjunction of the whole of life. The words also, *having no beginning nor end*, precedaneously indeed pertain to the body which is moved in a circle, but on account of this body, to the whole world. In short, to the heaven having no beginning nor end of all eternity, it is accurately added, that *it possesses and comprehends in itself infinite time*. For if it were generated from some beginning of time, it is evident that time would have an existence prior to its subsistence; and if it were corrupted in a certain part of it, time would exist after its subsistence. He renders it manifest, therefore, that time neither exists prior nor posterior to the heaven, through its possessing and comprehending in itself infinite time. For time, as Plato says, was generated together with the heaven; and therefore was not prior to it. But the infinity of time, makes the extension of the being of heaven

well to persuade oneself that ancient assertions, and especially those of our ancestors, are true, and that some one of those natures which possess

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heaven to be infinite. The infinite, however, here, must not be understood according to energy, but must be considered as a procession to infinity; for such is time, having its existence in becoming to be, i. e. in a procession or tendency to being. But how, Simplicius adds, does he say that time is possessed and comprehended by the heaven? Perhaps, as Alexander thinks, because time is produced by the heaven; since time is the number of the motion of it, and there is not any time beyond the heaven; and because every thing which is generated is comprehended by its generator. This, however, deserves attention. For if time is the measure of motion, and not that which is measured, it will be the cause of that which measures. And if time was generated together with the heaven, how is the motion of the heaven the cause of time? Perhaps, therefore, as there are many goods which give completion to the heaven and the whole world, time, in short, was produced by the demiurgus as one, and the most principal of these, as Plato says in the Timæus. For the demiurgus, says he, being willing in a still greater degree to assimilate the world to its paradigm, which is eternal, gave time to the world as an image of eternity. As it gives, therefore, completion to the world, it does not comprehend the world as some fancy, who conceive that it existed prior, or will exist posterior to it; but it is possessed and comprehended by the world, being itself a certain part which gives completion to it. From what has been demonstrated, therefore, Aristotle says, belief may be obtained that the heaven and the whole world are ingenerable and incorruptible; and still farther, from this also, that those who are of a contrary opinion, and who assert that it is generable and coruptible, are confuted. For, if the truth is as we say, it will follow that it is ingenerable and incorruptible, but this will not follow as they say, viz. who assert that it is generable and corruptible, or ingenerable but corruptible, or generable and incorruptible,—if this be the case, what has been demonstrated, will have great weight in procuring credibility concerning its immortality and perpetuity. But immortality is asserted of a neverfailing subsistence, as we may learn from the Phædo of Plato, or in other words, it is stability of life. The accuracy also of the words of Aristotle, in conjunction with philosophic caution, is admirable. For the conclusions made by him about the heaven and the world, that they are ingenerable and incorruptible, are not contingent, but necessary; but the conclusions made by them are not possible. Hence if it is not possible for the heaven and the world so to subsist, as they say, neither will they so subsist; except, that the subversion of the opinions of others, introduces the *position*, but not the *necessity* of ours, and on this account, he says, it has great weight in procuring *credibility*, but he does not say in procuring *demonstration*. What then, Simplicius adds, has not this been accurately demonstrated? To this he replies, may we not say, that in those things in which it is necessary that a thing should subsist in this or that manner, he who subverts one of these modes, which is defended by others, establishes the other? If, therefore, the world can neither be generable, nor ingenerable but corruptible, he evidently demonstrates it to be ingenerable and incorruptible. But if any thing is established from necessity, through the subversion of other things, it cannot now be said that this is established through proper reasonings and demonstrations; for such a mode is accidental, and not properly demonstrative.

motion is immortal and divine, possessing indeed such a motion as to have no end, but rather to be itself the end of other motions. For end is among the number of things which contain; and circulation itself being perfect, comprehends imperfect motions, and those which have an end and cessation. For it has neither any beginning nor end, but is unceasing in infinite time. But with respect to other motions, to some it is the cause of their beginning, but to others of their receiving a cessation. The ancients also attributed heaven, and the upper region, to the gods, because this alone is immortal. But the present reasoning testifies that it is incorruptible and ingenerable, and, besides this, that it is impassive to all mortal difficulty[1]. It likewise adds, that it is without

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[1] Aristotle, in a manner perfectly according to art, prior to demonstrations, adduces probable reasons, that the celestial body is ingenerable, and also when he says in the first book, "*For all men believe that there are gods, and all men, both Barbarians and Greeks, who think that there are gods, assign the highest place to a divine nature, thus conjoining the immortal with the immortal; for it is impossible it should be otherwise.*" And now again, after demonstration, he adds the testimony of ancient and paternal assertions, in order to procure a firmer belief. For arguments from probabilities, prior to demonstration, give the mind greater promptitude and strength for the demonstration, yet afford a suspicion of some paralogism, and demonstrative imbecility; but such like arguments after demonstrations, render belief in the demonstrations more accurate, and at the same time more sympathetic. Hence Aristotle employs them after demonstrations; and it is usual with Plato, after demonstrative conclusions to introduce fables. Now, therefore, Aristotle says, it will be well, confiding in demonstrations, to persuade oneself still more, that ancient assertions, and especially those of our ancestors, about the gods, which have been delivered to us in succession from our fathers, are true. For not all ancient assertions are paternal, but those only which have been delivered from our fathers. But those especially are such which pertain to the honour and worship of the gods; because all men participating of these, endeavour to preserve them immutable, as being delivered by the gods themselves. Among these traditions also is the opinion, that all the celestial bodies possessing motion from themselves, are natural, animated, and divine bodies, having a never-failing motion, so that there will be no end of it; and that these bodies as immortal pertain to the gods. To these assertions, therefore, he says demonstration also bears testimony, evincing that the heaven is ingenerable and incorruptible. But that it is connascent with the human soul to think the celestial bodies are divine, is especially evident from those who look to the celestial bodies through pre-conceptions about divine natures. For they also say that the heavens are the habitation of God, and the throne of God, and are

out labour, because it requires no violent necessity which by impeding might prevent it when naturally adapted from being moved in another manner. For every thing of this kind is laborious, by how much the more

are alone sufficient to reveal the glory and excellence of God to those who are worthy *; than which assertions, what can be more venerable? And yet, Simplicius adds, speaking of the Christians, as if forgetting these words, they fancy that more imperfect fabrications, are more honourable than the heavens; and thus strive to dishonour them, as if they were made in order to injure man. But the motion of the heaven has been considered by mankind as unceasing and never-failing, from its always possessing an invariable sameness of subsistence, since it is not subject to any essential change; and in consequence of reasoning from observations which have been delivered in succession. For it is not possible that any thing corruptible could have remained in the same condition for such an extended period prior to the present time. And in my opinion, the beauty of the heavens, which far surpass the beauty of sublunary natures, and *the natural conversion to them of souls which have not been previously corrupted*, are sufficient to produce conviction that they are divine. The energy of them also on sublunary bodies, and their containing all bodies in themselves, is sufficient for this purpose. For this also is a supernatural sign of absolute and divine transcendency, to generate all things, and comprehend all things in themselves, leaving external to themselves none of their productions. But what is Aristotle's meaning when he says, that the motion of heaven having no end, is the end of other motions? For how is one motion the end of another, the more universal of the more partial? And how in the second figure, does he appear to syllogize from two affirmatives, when he says: End or boundary is among the number of things which contain. The celestial motion being perfective contains. The celestial motion being perfective, therefore, is an end? For this mode of complication in the second figure is reprobated, as not having any necessary conclusion. Aristotle, however, concludes the syllogism in the first figure, as follows: The motion of heaven being perfective,

* Simplicius in his Commentary on the first book, as well as here, quotes the Psalms of David: and it seems reasonable to conclude from these words of David, that the Jews did not, like the Christians, believe that the heavens are corruptible. This impious opinion has, in consequence of the Newtonian system of astronomy, become, in Europe at least, almost universal; all the celestial orbs, according to that system, being dense, heavy bodies, like the earth. This making earth of heaven; however, among many other dreadful innovations of more modern times, is very far from being the way to make a heaven of earth.

But it is here necessary to observe, that another passage cited by Simplicius, is most erroneously translated, at least according to the Septuagint version, in the vulgar translation of the Bible. This passage is in Psalm 19th, verse 4th; and in the Septuagint is as follows, εν τῳ ηλιῳ εθετο το σκηνωμα αυτου, which evidently is, *He has placed his tabernacle in the sun*. But this in the vulgar version is, *In them* (the heavens) *hath he set a tabernacle for the sun!* Thus too, in the other passage alluded to by Simplicius, which is in Psalm 104th, v. 5, the vulgar translation is, "*Who laid the foundation of the earth, that it should not be removed for ever*;" but instead of *for ever*, it should be *for ever and ever*; for the Septuagint is, εις τον αιωνα του αιωνος. What could induce the English translator to commit two such obvious errors? Perhaps because he not only believed the world would be destroyed, but was also a Copernican. If, however, divinity made the earth so that it should not be removed *for ever and ever*, the corruptibility of the world is not a doctrine of the Old Testament.

more it is perpetual, and destitute of the most excellent disposition. Hence neither must it be admitted that it subsists conformably to the ancient fable which asserts that its safety requires the aid of a certain Atlas;

tive, comprehends other motions. That which comprehends other motions is the end of other motions: But the peculiarity of things which comprehend, is to be the end of the things comprehended. Indeed that the motion of heaven being unceasing, contains all other motions which have a beginning and end is evident, since it exists prior to, together with, and posterior to them, although the universal temporal circulation becomes a certain part of the whole, being the measure of the temporal life of mortals, or of the mutation of each of them. As, therefore, the beginning and end of the diurnal and temporal circulation is comprehended in the whole circulation of the heaven, so likewise is each of the sublunary motions; and on this account also it is said to contain other motions, and to be the end of them, itself having no end. For the beginning and the extremities of temporal motions, are bounded by the never-failing; the motion of the heaven being never-failing, because whatever is assumed of it, is not only the extremity of the past, but also the beginning of the future. But how can that ever fail in which the same thing is the beginning and end? Or how in short can it have either a definite beginning or end? Such then being the motion of the heaven, to some things it is the cause of their beginning, but of others it receives the rest. It is the cause indeed of beginning, because all generation originates from it; but it is not the cause of rest, because the motion of the heaven is not properly the cause of corruption, as neither is the demiurgus of the universe; but corruption necessarily accedes to things which are not able to subsist perpetually; just as disease accedes to natures which are not naturally adapted to be always well. The motion of the heaven, however, receives the rest of things which are at rest, both because as the principle of motion, so likewise rest is in it, and especially because the corruption of one thing is the generation of another, and the elements in composites being resolved, are returned to their wholes.

Simplicius adds, and Aristotle appears to me in what he here says, to signify the mandate in the Timæus of Plato, of the demiurgus to the celestial gods, "Increase mortal natures by supplying them with aliment, and receive them back again, when dissolved by corruption." But Aristotle having observed that the ancients attributed heaven to the gods, in consequence of its never-failing motion and immortality, subjoins, "*that the present reasoning testifies that it is incorruptible and ingenerable*," to the indemonstrable and essentially natural conceptions of the ancients, adding demonstrative accuracy. At the same time also he shows that it is impassive to all mortal difficulty: not that it is simply impassive; for the celestial bodies suffer something, being perfected by each other, as the illuminations of the moon from the sun clearly evince, and the different energies of different mixtures of rays, on sublunary natures. But it is impassive to all mortal difficulty. For thus in the preceding book he shows that it is unchanged in quality, denying of it passive qualities, and such as are inherent in generable and mortal natures. But it may be said, if the celestial bodies are impassive to such like affections, how is it possible that the lunar sphere being heated by the sun, the air also being heated by it, the lunar sphere should not be passively affected?

Atlas; for those who composed this fable seem to have had the same conceptions as posterior philosophers. For *as if all the bodies on high had gravity, and an earthly nature*, they fabulously introduce an animated necessity as the support of the heaven. Neither, however, after this manner, nor through obtaining a circumgiration more rapid than the motion of its proper tendency, according to the assertion of Empedocles, must it be supposed that it has been preserved for such a length of time. Nor is it reasonable to think that it remains perpetual through the compulsion of soul; for it is not possible that such a life of soul can be free from pain and blessed. It is also necessary that the motion which subsists with violence, if it moves the first body which is naturally adapted to be moved otherwise, and if it moves it continually, must be void of leisure, and removed from all intellectual facility of energy; if unlike the soul of mortal animals it is without that remission of the body which takes place in sleep; but the fate of some Ixion must necessarily detain it perpetual and unwearied. If, therefore, as we have said, the first lation can subsist in the manner already mentioned,

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affected? This, Simplicius adds, the interpreters solve by saying that not every thing suffers from every thing, but that only which is naturally adapted. For neither is the hearing passively affected by colours, nor the eye by sounds, because they are impassive to them. But that which happens from the marine torpedo is an evident argument, that not every thing acts upon every thing, and that things intermediate which transmit a passion, do not always themselves suffer. For when this fish falls into the net, the men that handle the ropes are benumbed, but the ropes themselves suffer nothing of this kind, because they are not the recipients of this passion. The fishes also that swim over the torpedo, appear to be benumbed, and to tend downward, though the intermediate water is by no means benumbed. It is not at all absurd, therefore, that the body of the lunar sphere should transmit the heat of the sun to sublunary natures, without being itself passively heated; for a certain corruption and generation are always inherent in an alliation of this kind. In short nothing hinders but that the lunar sphere may transmit the solar rays to sublunary natures, in consequence of suffering *perfectively* from the sun; and that sublunary natures may suffer from the rays in such a manner as they are naturally adapted to suffer. But they are naturally adapted to be heated, and separated passively. For as the participations of the other stars, not being themselves hot or cold, according to passive heat or cold, yet distribute such like dispositions to terrestrial natures; thus also the moon, being illuminated by the sun, and transmitting its light to us, is not heated indeed itself passively, nor is separated by the light; but sublunary natures participate of it passively.

tioned, it is not only more becoming thus to conceive concerning its perpetuity, but in this way only can we unfold assertions confessedly concordant with our *prophetic conceptions about the gods.* But let thus much suffice at present for things of this kind [2]."

CHAP.

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[2] After concluding what has been demonstrated in the first book, that the heaven is ingenerable and incorruptible, and superior to all mortal difficulty, Aristotle now shows, that its motion in a circle, and permanency in it is without labour, natural, and not violent. But he very properly adds *the violent* to *necessity;* because not every thing which is necessary is violent. For eternal natures subsist indeed from necessity, but not by violence. He shows, however, that the motion of the heaven in a circle is without labour and natural, as follows: The heaven is indigent of no violent necessity, which may prevent it from being moved in a different manner, like bodies which have a tendency downward, but which are made to be moved in a circle. That which is in want of no violent necessity to its motion, has this motion unattended with labour. The heaven therefore is moved with the motion in a circle, without labour, and according to nature. And that a thing which is not in want of such a necessity is moved without labour, he shows from that being laborious, and destitute of the most excellent disposition, which is indigent of violent necessity. For the best disposition exists not according to violent necessity, but according to natural perfection. Not only however the violent is laborious, but also the laborious is violent. If, therefore, the laborious is violent, that which is not indigent of violent necessity will be without labour. But that the heaven does not require violent necessity is evident from this, that being divine, it has the most excellent disposition; and that which has the most excellent disposition, does not require violent necessity, since those natures which do require it, are destitute of the best disposition. This also is evident from nothing accurate being asserted by those who instead of a cause introduce a certain necessity of such a motion and permanency to the heaven. For some assign a fabulous necessity, as the reason of the heaven not falling, but permanently revolving on high, as Homer says of Atlas:

> Atlas by strong necessity sustains
> Heav'n's ever-rolling, wide-extended plains;
> And the long pillars which on earth he rears,
> End in the starry vault and prop the spheres *.

But others introduce a physical necessity instead of a cause why the heaven does not tend downward, viz. its circulation being stronger than its proper tendency, as Empedocles and Anaxagoras say. Others, again, introduce a psychical necessity, or a necessity arising from soul, the soul of the heaven urging it to remain perpetually moved with this motion, as Plato appears

* The two last of these lines are to be found in the first book of the Odyssey; but I know not where the other two, which in their present state in Simplicius do not make a verse, are to be found.

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to say when in the Timæus he asserts of this soul, "that circularly enfolding itself from the middle, as far as to the extreme heaven, it began an unceasing and prudent life through the whole of time."

Simplicius adds, that if what is said of Atlas indeed, is a human fiction devised from a suspicion that the heavenly bodies have gravity, it is justly confuted by Aristotle, because they have neither gravity nor levity. But if it is a fable concealing something divine and wise in itself, it must be said that Atlas is one of those Tartarean gods who are about Bacchus *; who because they do not perfectly attend to him, i. e. do not energize according to Tartarean separation alone, about the Dionysiacal energy, but in a certain respect also incline to the Jovian connection †, energize according to both these characteristics. Atlas, therefore, being one of these Titans, energizes according to both these, about the greatest parts of the world, separating indeed the heaven from the earth and sustaining it, so that the natures above may not be confounded with those beneath; but having separated he again endeavours to connect the heaven and the earth with each other. For pillars possess both these powers, viz. a power of separating, and a power of connecting things placed above with those placed below. But neither is the motion of the heaven, nor the permanency of the earth in the middle, occasioned by the rapid circulation of the etherial body, the lation according to its own proper tendency which has gravity, being diminished, as Empedocles, Anaxagoras, and Democritus, appear to say. For though the etherial body had gravity, yet the circulation being more rapid and stronger than its tendency downwards, both the earth and the heaven would remain in their proper places, the former being established in the middle, and the latter being moved in a circle; just as they say the water in a bowl does not run out, when the bowl is whirled round, if the circulation is more rapid than the tendency of the water downward. Aristotle, therefore, says it is improbable that the heaven and the earth should have been so long preserved in the same condition, if this condition was contrary to nature. For it is reasonable to suppose that the violent counteraction of the tendency downward might continue for a little time, but it is impossible that it should continue for ever ‡. Hence, neither could the heavenly bodies be thus perpetually moved, if having gravity they are naturally adapted to tend downward.

In the third place also, it is absurd to say that a divine body remains perpetually moved, in consequence of being compelled by its own proper soul; or that the motion in it being compelled by soul, can remain perpetual. For that which is effected by violent necessity cannot be perpetual; since this is contrary to nature; and that which is contrary to nature, being a falling off from that which is according to nature, cannot continue for ever. For it is also necessary that there should be that which is according to nature; and it is impossible that both should subsist at one and the same time. In the fourth place he shows the impossibility of this, from the moving soul; that neither after this manner, is it possible that such a life should be without pain and blessed, but that it must be void of leisure, and removed from all intellectual facility of energy; if the first body being naturally adapted to be moved differently, for instance to the middle, its moving soul,

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* Bacchus is the deity of the intellect and soul of the world.

† Jupiter, as being the source of life intellectually, is peculiarly the source of connection to things.

‡ If this therefore be true, as it most undoubtedly is, the doctrine of centripetal and centrifugal forces, must no longer be admitted in explaining the motions of the planets.

violently compels it to be moved in a circle. For not only that which is moved labours from a motion which is contrary to nature and violent, but also that which moves it, and especially if it moves continually and perpetually. For though it is difficult indeed, yet for once it may be borne, through the remission of that which presses; but continually and perpetually, it is intolerable. Such a life also is worse than that of the souls in mortal animals; since they indeed, though their proper bodies are naturally adapted to be moved differently, according to the predominating tendency of the elements in them, and are therefore violently moved by their souls, yet they rest from this energy in sleep, and in other animal relaxations. But the souls of the celestial bodies, and which on this account are divine, will never have any rest from the motion contrary to nature.

With respect to the fable of Ixion, it is as follows: Ixion being present at the marriage of Juno, a cloud in the shape of that goddess drew near to him; and he having connexion with the cloud, a centaur was produced. But Jupiter knowing the affair, bound Ixion to a wheel, so that he might be incessantly rolled on it. The fable perhaps signifies that Ixion presided over a certain political and royal providence; but this form of life is heroical. Appearing, however, according to the similitude of Juno to be unworthy of such a life, he fell into the embraces of a certain material and obscure image of such a dominion; which the cloud signifies, it being obscure and more material air. Mingling with this cloud he begot a centaur, which signifies that his energies were in the confines of the political and intellectual life. But he was bound by Jupiter, the demiurgus, who distributes to every thing according to its desert, to the wheel of fate and generation, from which, according to Orpheus " it is impossible for him to be liberated who is not commisserated by those gods, whom Jupiter appointed to diversify and roll human souls in the circle of malignity."

It now remains to enquire with what motion nature moves a celestial body, and with what motion soul moves it. Nature then is not of itself sufficient to move a perfect and essentially natural local motion; for neither is the motion of the four elements according to the tendency to the whole perfect and self motive, as being inherent in the mover, but rather resembles that which is casual, and which is effected in a certain period, according to that power of wholeness which is implanted in a part. For they have not in themselves as being natural only, that which properly moves; since nature moves not being self-motive, but moved by something else, in consequence of not being more motive than moved. It may be said, therefore, that parts depend on the whole, and on the perfect animation in the whole, but are deprived of a perfect nature. They are said, however, to possess nature, so far as they are again adapted when moved, to be conjoined with the whole. But the natural and animated whole, is properly moved through nature as a medium. For *nature is a certain vital aptitude in a subject body*, through which the body is adapted to be moved by soul, and which through itself as a medium, introduces the motive power of soul into body. And this indeed appears to be conformable to the doctrine of Aristotle, since he says that soul is the *entelecheia* * of a natural body. In what follows also he says, " We do not see in any thing else, whence the principle of motion is derived " And again, " we have before shown, that such powers are inherent in things which have the principle of motion." But he clearly says, that things which have soul have the principle of motion, and

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* This word signifies *perfect energy*. See p. 141 of the Physics.

CHAPTER VI.

LET us now direct our attention to what Aristotle says concerning the tendency of bodies upward and downward as the causes of their gravity and levity; as this forms one of his most interesting dogmas, and to most readers will be perfectly novel. Towards the end therefore of the 4th book on the Heavens, he observes as follows:

"In the first place, therefore, determining about that which is especially the subject of doubt with some, we shall relate why some bodies always tend upward and others downward, according to nature, and others again both upward and downward. After this we shall speak about the heavy and the light, and the passive qualities which take

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not natural things according to the interpretation of Alexander. Prior to Aristotle also, Plato was of the same opinion. For in the 10th book of the Laws he says, that the motion which is moved by something else, and which moves other things, is nature; subsisting according to the aptitude to be moved, and not according to the aptitude of being motive. Hence, if it should be asked with what local motion nature, and with what local motion soul, moves the heaven? We reply, that soul through nature as a medium causes the heaven to be moved in a circle, the motion being one and the same. But the heaven is moved by nature indeed, possessing a self-natural and not violent motion, and an aptitude according to it to be moved. And it is moved by soul according to a transitive energy, to which it is naturally adapted; just as it is circularly moved by intellect according to an invariable sameness of subsistence. For through soul and intellect which impart the vital motion inherent through nature in the body, it is perfected, and restored to the similitude of intellectual energy. Hence also the divine Plato investigating why the heaven is moved in a circle, says, that it is because it imitates intellect. But Aristotle having shown that it is not possible the motion of the heaven can be violent, according to any of the above-mentioned modes, but that it is necessarily natural, if it is perpetual, adds, *that these things accord with our prophetic conceptions about the gods*, viz. that it is requisite it should be without labour, and remain in perpetual vigour and blessedness. For thus alone can we unfold incontrovertibly concordant assertions, if we say that it energizes not violently, but conformably to its nature. But he calls this our common conception about the freedom from labour and blessedness of a divine nature *prophetic*; because being better than demonstrative evidence, it is most firm and irreprehensible. For such is prophetic information, proceeding into the soul according to divine inspiration, in a manner superior to all demonstration, in conjunction with genuine faith.

place about them, and show through what cause each of these is generated. Concerning every thing therefore tending to its own place, the like opinion must be entertained, as concerning other generations and mutations. For since there are three motions; one according to magnitude; another according to form; and another according to place; in each of these we see that a mutation is produced from contraries into contraries, and into things between, and that mutation is not into any thing casual. In like manner, neither is any thing casual motive of any thing casual; but as that which may be changed in quality and increased are different, so likewise that which is able to effect a change in quality and to produce increase. After the same manner also it must be assumed that not any thing which is casually motive according to place, is motive of any casual moveable. Hence that is motive to the upward and downward, which is productive of gravity and levity; but that is moveable which is in capacity heavy and light. And for any thing to tend to its own place, is nothing else than to tend to its own form[3]. Thus, therefore, that which is said by the ancients may be more readily admitted, viz. that the similar tends to the similar; for this does not entirely happen to be the case. Thus if any one could transfer the earth to the place where the moon is now, each of its parts would not tend to it, but to the place in which it is now situated. In short, this must necessarily happen to things similar and without difference, from the same motion; so as that whither any part thither also the whole is naturally adapted to tend. But since place is the boundary of that which contains; and upward and downward, the extremity and the middle, contain every thing that is moved; and since this after a certain manner becomes the form of that which is contained;—hence for a thing to tend to its own place, is to tend to that which is similar. For things which are successive are similar to each other; as for instance, water to air, and air to fire. The contrary however may be asserted of the media, but not of the extremes; as for instance, that air is similar to water, and water to earth. For always that which is higher is to that which is under it as form to matter[4]. But to investigate

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[3] If, says Aristotle, that which is productive of gravity and levity is motive to the upward and downward, and not any thing casual, but the moveable which is in capacity heavy, and the moveable which is in capacity light, are moved to their own places, that which tends either upward or downward to its own form, tends from capacity to energy. But the antecedent is true from what has been previously demonstrated, viz. that what is productive of gravity moves, and that what is in capacity heavy is moved to that which is heavy in energy; and therefore the consequent is true, that what is naturally moved upward or downward, is moved from its own form in capacity to its own form in energy. Thus in heat, if that which is productive of heat moves, but that which is in capacity hot is moved to the being hot in energy, it is evident that for a thing to be moved to that to which it is naturally adapted, is nothing else than for it to be moved to its own form, and to become hot in energy. And as long as it is moved upward or downward, it has not yet perfectly received its own form, since it is yet in generation, or becoming to be. When therefore it arrives at its proper place, then it acquires its proper form; for it then acquires that in energy which it was in capacity. Why therefore are bodies naturally moved downward? Because the very essence of that which is heavy is to be naturally downward. Those things therefore which are yet in capacity heavy, are changed to their own form, by that which is naturally adapted to move according to gravity, viz. by that which causes earth or water to be heavy in energy. For the parts of wholes, though they are not in any detaining place, when they are in continuity with their wholes, yet, together with the wholes, they are in that place, in

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in which having a subsistence in energy, they also acquire the perfection of themselves according to form. If therefore this is true, and, as Aristotle says, for any body to tend to its own place is to tend to its own form, that which acquires the form of the heavy or the light, is no longer moved.

[4] If any one wishes to find more proximately the tendency to the similar, he will find it to be the tendency of a thing to its own place. For since place is the boundary of that which contains, that which tends to its proper place, tends to the boundary of that which contains. But that which contains is similar to that which is contained, because things successive are similar to each other. Thus water is similar to air, and air to fire. And *vice versa* in the middle elements it is true to say, that air is not only similar to fire, but also to water; so that it is similar both to that which is placed above it, and to that which is placed beneath it. In like manner water is similar to air and to earth. But the extremes, viz. fire and earth, have no longer this similitude. For neither has fire any element above it, nor earth any element beneath it. That similars, however, are successive, is evident from their being easily changed into each other, being of a kindred nature according to the common quality inherent in them. According to this perhaps fire and earth subsist *vice versa*, having the common quality dryness. But having said that place is the boundary of that which contains, he adds, that it contains all things which are moved, not simply, but those which are moved upward and downward, and the extremity and the middle. For the body which is moved in a circle, being itself the extremity, is not comprehended by the middle and the extremity, but only the bodies which are moved upward and downward. But he does

gate why fire tends upward, but earth downward, is the same thing as to enquire why that which may be restored to health, if it is moved and changed so far as it may be restored to health, arrives at health, and not at whiteness; and in a similar manner with respect to every thing else which may be changed in quality. Moreover that also which may be increased, when it is changed, so far as it may be increased, does not arrive at health, but at an excess of magnitude. In like manner also with respect to each of these; one is changed in quality, but another in quantity; and in place, light bodies tend upward, but heavy downward; except that some things appear to contain in themselves the principle of mutation, viz. the heavy and the light; but others do not, but derive it externally, as that which may be restored to health, or that which may be increased. Sometimes however these are changed from themselves; and a little motion being produced in things external the one arrives at health, but the other at increase. And since that which may be restored to health, and that which is susceptible of disease are the same thing, if it is moved so far as it may be restored to health, it tends to health; but if it is moved so far as it may be diseased,

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does not appear to have added this in vain, but for the purpose of evincing, that of the bodies which are moved upward, that which is placed above comprehends that which is placed beneath, just as fire comprehends air; and that the bodies which are moved downward, are contained by that which is placed beneath. For these are more proximate to the containing bodies, viz. to the extreme and the middle. The body however which contains, becomes after a manner the form of that which is contained, which he says it has as being situated successively. For if the upward place gives form to bodies that are light, which then become light when they are in the upward place, but the downward place gives form to heavy bodies, the extremity upward is the form of fire, because in this place it possesses its perfection, but fire is the form of air, because the ascent of the latter is as far as to the former. And again, the middle is the form of earth, but earth is the form of water, because water when it becomes situated in earth, as then having acquired its own form according to gravity, is at rest. And the extremes indeed, are analogously forms, as giving a specific distinction to the bodies which are situated in succession; but the middles are analagous to matter, as acquiring a specific distinction from the extremes. For fire imparts levity to air, and earth gravity to water. Simplicius adds, But that the mode of division of the four elements into the formal and material, is different from that mode, according to which heavy and cold bodies have the relation of matter, but light and hot bodies, of form, Aristotle himself asserts elsewhere, and Theophrastus in his book On the Generation of the Elements: and Possidonius the Stoic deriving this distinction from these philosophers, every where uses it.

eased, it tends to disease. The heavy and the light, however, appear more than these to possess in themselves the principle of mutation, because the matter of these is most near to essence. A token of which is this, that lation belongs to things that are entire and complete, and is last in the generation of motions; so that this motion will be the first and according to essence[5]. When therefore air is generated from water, and the light from the heavy, it arrives at the upward place. At the same time however it is light and is no longer generated, but is there. It is evident, therefore, that being in capacity and proceeding to energy, it arrives there, and becomes so much in quantity and such in quality as it is adapted to possess in energy. There is also the same cause why earth and fire are now moved to their own places, when nothing impedes. For nutriment, when that which impedes, and that which may be restored to health, when that which detains, is removed, are immediately moved[6]. And that moves indeed which made from the

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[5] Having shown that bodies which naturally tend upward and downward, tend as to their proper form and perfection, and from a subsistence in capacity to a subsistence in energy of which they possessed the capacity, he now also confirms this from other motions. He shows, therefore, that as in other motions, the mutation according to nature from that which is in capacity to the characteristic property of accidents, is into something else, the like also takes splace in local motion. But having said that things which are changed into health from themselves, require a little external co-operation, he adds, that that which may be restored to health, and that which is susceptible of disease are the same thing; on which account if it is moved so far as it may be restored to health, it tends to health; but if so far as it may be diseased, it tends to disease. For every thing is moved to that to which it possesses the power of being moved. Collecting, therefore, that bodies which are locally moved, for these are the heavy and the light, have the principle of motion in themselves more than other things which are naturally moved, he adds the cause why bodies which are locally moved are more perfect. But being now more perfect in energy, they more contain in themselves the principle of motion. For on this account, in short, animated natures being more perfect than others, especially abound with the power of being moved by themselves. For that which is imperfect, and has not yet a being, is moved by this, by which also it is generated. But he adds the cause of that which is locally moved being more perfect, viz. because the matter of things thus moved is most near to essence; obscurely assigning the cause. For he calls matter the aptitude of these, and that which is in capacity, but the form which is perfective of them, essence. For every thing which is in capacity is matter with respect to that to which it is in capacity, and the essence of every thing is defined according to the form which is perfective of it. Since therefore things which are locally moved are not changed according to any thing which is inherent in them, but according to place alone, hence things which are now essentially perfect, are near to local motion. For the aptitude according to local motion, proceeds not as to essence but as to energy; on which account also divine bodies do not disdain to be moved with this motion, because it possesses much of an efficacious nature. For to be changed in quality and increased, and still farther to be generated, are rather passions than energies; but local motion is rather energy than passion. Hence things which are locally moved, so far indeed as they are moved, have not yet acquired the perfection pertaining to this motion, if they are moved to the full perfection and form of themselves according to this; but having arrived at their own place through local motion, they acquire from this their own perfection, becoming that in energy which they were formerly in capacity alone. Aristotle therefore

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fore very properly says, that the aptitude of these is most near to essence, since being essentially perfect, they require to energize alone; and if they obtain this through motion from themselves, they require no other motion. But that they are near to perfection, and more perfect than things which are moved in a different manner, he adduces two signs; one, that such a motion is the motion of things complete, that is, of things which are entire essentially, and not so according to any one of the things which are changed in them. For things which are passing into existence, which are increasing, and changing in quality, are not yet complete with respect to a subsistence by themselves. In the second place, he infers this from things which are locally moved, being the last in generation; but things which are last in generation, are more perfect. For in animals things imperfect precede the perfect in generation; viz. the seed and menstruum, the gradual formation of the embryo, and that which is just born, precede the perfection which the animal acquires in time. And in a similar manner in plants, each proceeds from the imperfect to the perfect. But that which is more perfect is prior in essence, as if for the sake of this, other things were pre-assumed. Local motion also is posterior to other motions both in animals and in inanimate natures. For animals when they are now perfect are moved according to place; and natural bodies when perfect acquire their natural local motion; fire indeed, when it tends to the extremity, but earth when it tends to the middle. But change in quality precedes, and after this increase, and thus the motion according to place accedes, and especially in more perfect natures such as animals. For these when now perfect and complete, are moved with a local motion adapted to animals. Hence local motion will be the first according to essence, arriving posterior to other motions, both in time and order.

[6] Aristotle having observed that things which are moved to their own place, are moved to their own form and perfection, delivers to us the distinction between things which are moved with their own motion in being generated and in changing from a subsistence in capacity to a subsistence in energy, and things which now are. He says, therefore, that when air is generated from water, and in short, the light from something heavy, it arrives at the upward place; but at the same time, together with receiving form, and becoming perfectly light, it is no longer generated light, but is so. If therefore that is now light which has emerged on high, it is evident that what is light in capacity, and proceeds to a perfect energy, is moved to the upward place; but there

the beginning, and that which removes the impediment, or whence it leaps back, as was said in the first discussion in which we proved that no one of these moves itself. And thus we have shown through what cause each of the things that are locally moved is so moved, and what it is for a body to be moved to its own place[7].

Let

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there it has a subsistence in energy. But having observed concerning things which are locally moved, that proceeding according to energy they arrive thither, he briefly adds also concerning other motions, that things according to quantity become so much, and according to quality such as they are adapted to be in energy; for instance, they become two cubits in length, and they become white. Having, however, spoken concerning things which are generated, he adds also concerning things which are now in energy, about that which is now fire, and that which is now earth, that in these also there is the same cause why they are moved to their own places when nothing impedes. For things which are in energy, and which are detained by violence in a foreign place, or are generated in a subject in a foreign place, as fire which is enkindled here, or a stone which is formed in the clouds, these also when nothing impedes, tend to the place naturally adapted to them, in which when they arrive at it, they acquire the perfection of their form. For whether they are in a foreign place on this account because they were there generated, they still partake in a certain respect of a contrary nature from which they were changed, and which they lay aside when they arrive at their proper places. Or whether they are detained by violence in a foreign place, thus also they are in a certain respect disposed contrary to nature. For that which is not naturally adapted to emerge above, if it is compelled to surpass and rise above other bodies, is then disposed contrary to nature. Hence things which now are seen to be in energy, when they are in foreign places, are in a certain respect imperfect, have something in capacity, are moved to that which is in energy, and are led to the perfect. That Aristotle indeed, is of opinion, that things which now appear to be in energy, have when impeded something in capacity, he evinces by adding, that nutriment, and that which may be restored to health, when that which impedes is removed, tend to the subsistence of themselves in energy, as yet being in capacity. For nutriment when it is in energy that which it was in capacity, for instance, when it is flesh, then it makes an addition, and nourishes and increases that of which it is said to be the nutriment. There is a great difference, however, with respect to subsistence in capacity, in that which is now generated, and in that which has not yet received form. For the latter is like grammar in a boy, but the former is like the capacity in one who possesses the grammatical habit, but does not energise according to it. And of this kind is the subsistence in capacity of that which may be locally moved. Aristotle also seems through this to solve the objection which says, if that which tends to its proper place according to nature, tends to its proper form, why does that which has now received its proper form tend to its proper place? And he says that the body which is locally moved perfectly receives its proper form, when it becomes situated in its proper place.

[7] Having observed that things which are locally moved contain in themselves the principle of

motion

Let us however now speak of the differences, and the accidents which subsist about them. Let it therefore in the first place be defined, as it appears to all men, that the simply heavy is that which subsists under all things; but the simply light that which emerges above all things. But I say simply, looking to genus and to those things in which both these are not inherent. Thus for instance any casual magnitude of fire is seen tending on high, unless any other thing should happen to prevent it, and of earth, tending downward. After the same manner also that which is more in quantity is more swiftly moved. But those things are in another respect heavy and light in which both these are inherent. For they emerge above and subsist under certain things; just as air and water; since neither of these is simply light or heavy. For both are lighter than earth; since any casual part of them emerges above it; but they are heavier than fire; for any part whatever of them subsists under it. With reference to themselves, however, one is simply heavy, and the other simply light; for air, of whatever magnitude it may

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motion more than things which are moved in a different manner, he makes the reader observe that this is said as with reference to a comparison with other things which are moved according to quantity and quality, than which things that are locally moved are more perfect, because even these have not properly in themselves the principle of motion. But in these also that which is asserted in the 8th book of the Physics is true, that nothing which is moved naturally moves itself, but every thing which is thus moved is moved by something else. He also calls his Physics the first discussions, as being employed about natural principles. He says therefore that things which are locally moved are moved by another. For all things are moved by that which made them from the beginning, and which through generation imparts to them gravity and levity. If any thing, however, prevents their tendency, as for instance, the tendency of fire upward, or of earth downward, that which removes the impediment, is the cause of their motion, but is a cause according to accident. That also, says he, from whence a thing leaps back, moves it in a certain respect, as the wall moves a rebounding stone, or a ball. Simplicius adds, that it is necessary however to consider whether such a motion as this is natural and simple; for it is neither an upward, nor a downward, but a lateral motion. Thus therefore that which was just before proposed is concluded and demonstrated, viz. why some bodies always naturally tend upward, but others always naturally tend downward, and others tend both upward and downward. For he shows that a body which is moved to its proper place, is moved to its proper form and perfection; and that it is the same thing to enquire why fire tends upward, but earth downward, as it is to enquire why that, which may be restored to health, if it is moved and changed so far as it may be restored to health, arrives at health, and not at whiteness.

may be, always emerges above water; and water, of whatever magnitude it may be, subsists under air. But since of other things some have gravity and others levity, it is evident that the cause of all these is the difference which there is in simple natures. For in consequence of one thing obtaining more and another less of these, some bodies will be light, and others heavy. Hence we must speak about these; for the rest follow the first; which also we say those ought to do who assert that the heavy subsists through a plenum, and the light through a vacuum. But it happens that the same things do not every where appear to be heavy and light on account of the difference of the first or simple bodies. I say for instance wood of a hundred pound weight will be heavier in air than lead of one pound weight, but will be lighter than the lead in water. But this is because all things have gravity except fire, and levity except earth. It is necessary therefore that earth, and such things as contain most of earth, should every where have gravity; that water should every where have gravity except in earth; and air except in water and earth. For all things, even air itself, have gravity in their own place except fire: of which this is a token that bladders when inflated are heavier than when empty. Hence if any thing has more of air than of earth and water, in water it may be lighter than something else, but in air heavier; for it does not swim upon air, but it swims upon water[8]. That there is therefore something simply heavy, and something simply light, is from these things evident. But I call that simply light which is always naturally adapted to tend upward, and

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[8] Ptolemy, the mathematician, says Simplicius, in his book On Momenta, or the inclinations of bodies, having an opinion contrary to Aristotle, endeavours to prove that neither water nor air have any gravity in their own places. And that water, indeed, has not, he shows from this, that those who merge themselves in it do not perceive the weight of the super-incumbent water, though many have descended into it to a great depth. To this however it may be said, that the continuity of the super-incumbent and subjacent water, and of that which subsists on each side, causes its weight not to be perceived. For thus in the cavities of walls, those animals which touch the walls on all sides, are not oppressed with its weight, because the wall sustains itself in every part. Hence if the water being divided should recede, it is probable that he who is merged in it would have a sensible perception of its weight. That air also has not any weight in its wholeness, Ptolemy shows from the same argument in bladders, not only contradicting the opinion of Aristotle, viz. that an inflated bladder is heavier than one that is not inflated, but also wishing to prove that it becomes lighter when inflated.

Simplicius adds, that he however found, from the most accurate experiment he was able to make, that an inflated bladder had the same weight with one that was not inflated; and that a certain person also prior to his time writes that he found they had very nearly the same weight; but that the bladder prior to its being inflated was rather heavier; which accords with what Ptolemy says. It is evident, therefore, if this experiment may be depended on, that the elements will be without a momentum in their proper places, none of them then having either gravity or levity: which Ptolemy acknowledges to be the case with water. And there will indeed be some reason in this. For if natural momentum or tendency is the desire of a proper place, the body which has obtained this place will no longer aspire after it; nor being in it, will it verge to it; just as neither does that which is satiated desire food. But if, as Ptolemy says, an inflated bladder is lighter than one that is not inflated, air will have levity in its own place; and it will also follow from the same reasoning, that water in its own place will have weight. For when we emerge from water, we seem to throw off a certain weight; unless perhaps by recovering the air which is the basis of respiration, we have a sensation of the deposition of weight from the strength of this. In short, if air is to water, as the simply light to the simply heavy, it is reasonable that the air should be more allied to the simply light, and that in its proper place it should have levity, as well as fire; and that water should have weight through its alliance to earth. For these have a certain difference, and on this account necessarily thus subsist. Hence if any one compares these two alone with each other, air must be said to be simply light, but water simply heavy, as Aristotle himself teaches us; so that air will alone have weight in fire, than which it is heavier, but water will have levity alone in earth, because it is lighter than it. And again, air in itself, and in those things prior to it, will have weight, but water in itself, and in that which is under it, will have levity. These things however are asserted conformably to the greatest of philosophers, Syrianus, the preceptor of Proclus. Perhaps, however, if these assertions are true, air may be said to be light in the elements posterior to it in one way, and in its own region in another way. In the other elements it may be said to be light, as tendieg from them to the upward region, but in its own region, as emerging above them, but not as tending from them upward. And it is necessary that this should be said by those, who think that an inflated bladder is lighter than one that is not inflated. For how, in short, is it possible to call air in its own place light, in the same manner as that which is naturally moved upward? For it does not wish to depart from its proper place. But if an inflated bladder weighs less than one not inflated, neither does this compel the elements to have a certain momentum in their own place, but it rather shows the non-inclination of them. For the air in a bladder, detains the bladder in its own place; but the bladder at the same time falling, i. e. not being inflated, having a terrestrial condition, and a privation of air, verges more downward. Thus also wood falling upon water, becoming situated according to a certain part of itself, in the place of air, the air receding into itself, establishes the earthly nature which is in itself in the region of air. That air however has weight in its own region, so as that on this account an inflated bladder draws more air, will be very dubious: for if this be admitted, air and that simply heavy which is always naturally adapted to tend downward, unless something impedes. For there are certain things of this kind, and all things are not, as some fancy, heavy. For to certain other persons also, there appears to be that which is heavy, and that it always tends to the middle. And in a similar manner there is also that which is light. For we see, as we have before observed, that earthly natures are placed under all other things, and tend to the middle. The middle however is defined. If therefore there is any thing which emerges above all things, as fire appears in the air itself to tend upward, but the air is at rest;—if this be the case, it is evident that fire tends to the extremity; so that it cannot have any weight, since if it had it would be placed under something else. But if this were the case, there would be something else which would tend to the extremity, and which would emerge above every thing that is moved. Now, however, no such thing is seen. Fire therefore has no weight. Nor has earth any levity, since it is placed under every thing, and that which subsides tends to the middle [9].

Moreover, that there is a middle to which the lation of things that are heavy tends, and from which things that are light are moved, is multifariously evident. In the first place, because nothing can be moved to infinity. For as nothing which is impossible is, so neither can it be generated. But lation is generation from one boundary to another.

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air in its own place will naturally verge downward, which is absurd, and appeared to be so to Aristotle. Simplicius concludes with observing, that since Aristotle says an inflated bladder weighs more than one not inflated, it is not easy to reject the judgment of a man so accurate; and that perhaps the air which is injected into the bladder from the mouth becoming more moist from a copious inflation, and compressed by the continuance of the inflation, adds some little weight to it. For this may be said by him who does not despise so great a man on account of his accuracy.

[9] One of the elements, says Aristotle, is simply heavy, and one is simply light, and all things have not gravity, as Democritus and his followers thought. Nothing however hinders but that fire, and all the other elements, may have gravity of such a kind as Plato says is the cause to each of them of their tendency to their proper place. For Plato, as has been before observed, calls such a tendency, gravity, differing from Aristotle only in the name; because he calls the tendency to the middle, gravity, denominating the middle the downward place, but the tendency to the circumambient levity, conformably to the custom of the multitude.

In the next place, fire tends upward, but earth downward, according to similar angles, and this is the case with every thing which is heavy; so that it is necessary there should be a tendency to the middle. But whether this tendency happens to be to the middle of the earth, or to the middle of the universe, since they are the same, is the business of another discussion. Since however that which is placed under all things tends to the middle, that which emerges above all things, must necessarily tend to the extremity of the place in which bodies are moved. For the middle is contrary to the extremity, and that which is always placed under, to that which is always placed above. Hence, the heavy and the light may be reasonably admitted to be two things; for there are also two places, the middle, and the extremity. That also which subsists between these is something, which is denominated another with reference to each of these. For that which is between is as the extremity and middle of both. On this account also there is something else which is heavy and light; as for instance, air and water. But we say that that which contains has the relation of form; and that which is contained, of matter. And this difference is in all the genera of things. For in quality and in quantity, one thing is rather as form, but another as matter. In like manner also in things pertaining to place, that which is upward belongs to the definite, but that which is downward, to matter. Hence, in the matter itself of the heavy and the light, so far as it possesses such or such a quality in capacity, it is the matter of the heavy or the light. And the matter indeed is the same, but the essence is not the same; just as that which may be diseased, and that which may be restored to health, are the same, but their essence is not the same: because neither is the essence the same of that which is diseased and that which is healthy. Hence, that which has a matter of such a kind is light, and is always upward; but that which has a contrary matter is heavy, and is always downward. And those things which have matters different from these, but which are so related to each other, as the simply light and heavy, tend both upward and downward. Hence, both air and water have levity and gravity. And water indeed subsides under all things except earth; but air emerges above all things except fire. Since, however, there is one element alone which emerges above all things, and one which subsists under all things; it is necessary that there should be two others which subsist under some one element, and emerge above some one. Hence, it is necessary that there should be as many matters as these viz. four, so as that there may be one matter which is common to all, especially if they are generated from each other; but that their essence should be different. For nothing hinders but that between contraries there may be one and many things, just as in colours[1]. For an intermediate subsistence and middle are predicated multifariously. Every thing therefore that has levity and gravity, has gravity in its own place (but earth has gravity in all places,) but it has not levity except in those things above which it emerges. Hence, when they are removed, that tends downward which is successive; air, indeed, to the place of water; but water to the place of earth. If, however, fire is removed, air will not be impelled upward to the place of fire, except by violence; just as water is drawn when there is one superficies, and any one may draw water upward with greater celerity than is the lation by which it tends downward. Nor does water pass into the place of air, except in the manner which has been just now mentioned. This however cannot take place in earth, because the superficies is not one. Hence, water indeed is drawn into an ignited vessel, but earth is not. But as earth if the air were withdrawn would not tend upward, so neither would fire tend downward; for it has not any gravity in its own place, as neither has earth any levity. But the two other elements would tend downward, if that which is beneath were withdrawn: because that is simply heavy which is placed under all things; but that which is relatively heavy tends to its own place, or to the place of those things above which it emerges through a similitude of matter. That it is necessary however to make equal differences in them is evident. For if there is one matter of all things; as, for instance, either a vacuum, or a plenum, or magnitude, or triangles; either all things will be impelled upward, or all things will be impelled downward, and there will no longer be another lation. Hence, there will be nothing simply light, if all things rather tend downward, because they are composed from larger bodies, or from a greater number, or because they are full. But we see this, and it has been demonstrated, that bodies similarly and every where always tend downward and upward. If however there is a vacuum, or any thing of this kind, that which always tends upward, will not be that which always tends downward. Some also of the intermediate bodies will tend downward with greater celerity than earth. For in a great quantity of air, there will be more triangles, or solids, or atoms. No part of air, however, appears to tend downward. The like also will take place in that which is light, if any one makes it to exceed in matter. But if there are two intermediate elements, how will those things be effected which air and water effect? For instance, if some one should say there is a vacuum and a plenum; fire therefore will be a vacuum, and hence it tends upward; but earth will be a plenum, and therefore it tends downward; air also will have more of fire, and water of earth. For there will be some water which has more of fire than a little air; and a great quantity of air which has more of earth than a little water. Hence it will be requisite that a certain multitude of air should more swiftly tend downward than a little water. This however never appears to take place any where. It is necessary, therefore,

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[1] Aristotle, in his books On Generation and Corruption, multifariously shows that it is necessary there should be two intermediate elements, and that all of them should be four. For because the specific contrarieties are two, viz. heat and cold, dryness and moisture, these being combined, it is necessary that all the elements produced from them should be four. He also proves this from the analogy of the qualities, from which the essence of each of the elements is derived. And farther still, from a certain communion with each other, through which their mutation into each other becomes easy, in consequence of possessing a certain common symbol. This is also proved, from that which is intermediate having a similitude to each of the extremes. These, therefore, being two, it is likewise necessary that this medium should be twofold. But the divine Plato also placing as extremes fire and earth, and asserting that the world so far as it is visible is from fire, but so far as it is tangible from earth, demonstrates that there are two media. For the universe being a solid, and having its extremities solid, and since the extremes ought to be conjoined from analogy, in order to the generation of the universe, two analogous media were requisite, in order to complete the solid proportion. But in colours there are many media. For not only the pale is a medium between black and white, but also the yellow and the purple.

fore, that as fire tends upward, because according to them it has a vacuum, but other things do not; and as earth tends downward because it has a plenum; in like manner air tends to its own place, and is situated above water, because it has a certain proper difference; and water for the same reason tends downward. But if both were one certain thing, or two things, and both were inherent in each, there would be a certain multitude in each, by which water will exceed a little air in a tendency upward, and air water in a tendency downward, as has been frequently observed."

CHAPTER VII.

The next dogma that particularly demands our attention, is the perpetuity of generation, and its being circularly infinite. This Aristotle demonstrates as follows, in the second book of his treatise On Generation and Corruption.

"Again, since it has been demonstrated that the motion according to lation or local motion is perpetual, it is necessary these things existing, that generation also should have a continual existence; for lation produces generation incessantly, in consequence of introducing and removing that which is generative. At the same time also it is evident, that what was before observed was well said, viz. that lation and not generation is the first of mutations; for it is much more reasonable that being should be the cause of generation to non-being, than that non-being should be the cause of existence to being. That, therefore, which is borne along has an existence, but that which is in generation, or becoming to be, is not. Hence, also, lation is prior to generation[a]. Since, however, it is supposed, and has been demonstrated,

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[a] Aristotle, supposing the doctrine to be admitted which he has delivered about causes in common, in the second book of his Physics, and the particular doctrine which he had delivered about matter, and the form of generable natures; supposing also the demonstration given

strated, that generation and corruption are in continuity with things, but we say that lation is the cause of generation; it is evident that from the existence of one lation, it will not happen that both will be produced, because they are contrary. For the same thing, and which always subsists after the same manner, is naturally adapted to produce the same thing; so that either generation or corruption will always exist. But it is necessary that there should be motions, which are many and contrary, either in lation, or in inequality; for the causes of contraries are contrary. Hence, the first lation is not the cause of generation and corruption, but that which subsists according to the oblique circle; (i. e. the zodiac) for in this motion the continued is one, and it has the property of being moved according to two motions. For it is necessary, if generation and corruption will always be continued, something will always be moved, in order that the mutations themselves may not fail. But two motions are necessary, in order that one of these alone may not happen to exist. Lation, therefore, is the cause of the continuance of the whole, but the obliquity of the zodiac, is the cause of acceding and receding; for it happens that at one time [the sun and planets] become remote from and at another near to us. But the interval being unequal, the motion will be anomalous. Hence, if

given in the eighth book of the Physics to be admitted, that the circular motion of the heaven is perpetual; asserts, in the first place, that the continued and perpetual motion of the heaven is the cause of the perpetuity of generation and corruption in the sublunary region. For the generative nature which by its access causes generation, by its recess causes corruption. But the perpetual motion of the heaven is the cause that the sun, who is the universal generator of inferior natures, perpetually accedes and recedes. The perpetual motion of the heaven, therefore, is the cause that generation and corruption are perpetual in the sublunary region. The truth of this will be confirmed by considering that the first mutation is the cause of other mutations. But the circular motion of the heaven, as is demonstrated in the eighth book of the Physics, and not generation, is the first mutation. The circular motion of the heaven, therefore, is the cause of generation and corruption. It is also much more reasonable, that a thing which exists, should be the cause of generation to that which does not exist, than that a thing which is not, should be the cause of generation to that which is. But that which is locally moved, while it is locally moved, exists. That however which is in generation, or becoming to be, while it is becoming to be, is not. Hence, it is reasonable that the heaven while it is locally moved should be the cause of generation and therefore local motion is prior to generation.

[the sun] by approaching and being near generates any thing, in departing and becoming remote, he will corrupt that thing: and if by frequently acceding he generates, by frequently departing, he will also be the cause of corruption; for of contraries the causes are contrary[3]. The corruption and generation also which are according to nature, are in an equal time. Hence also the time and the life of every thing have number, and are distinguished and bounded by this. For of all things there is order, and every time and life are measured by a period; except that all are not measured by the same period, but some things by a less, and others by a greater. For to some things a year, to others a greater, and to others a less period, is the measure[4]. Sensible perception also appears to accord with what we have

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[3] Though the circular motion of the primum mobile, is the cause of the perpetuity of generations and corruptions in the sublunary region, yet the cause on account of which generation and corruption alternately succeed each other, is not the direct motion of the primum mobile, but the oblique motion of the zodiac. For generations and corruptions so succeed each other, that there is one time of generation, and another of corruption. If however that which generates through motions always possessed an invariable sameness of subsistence, there could not be one time of generation and another of corruption. It is necessary, therefore, that what generates through motion, should not possess an invariable sameness of subsistence; but through the direct motion of the primum mobile, the sun who is the universal generator, would always possess as sameness of subsistence. Hence it is necessary that beside the motion of the primum mobile, there should be another motion by which the sun may subsist variously, not indeed that he may be moved with a contrary motion, since a circular motion has not properly a contrary, but that he may be moved obliquely, so as as that sometimes approaching to us, he may regard us with rays less oblique, and at another time, when departing from us, his rays may shine upon us more obliquely. Hence, as in order to the perpetuity of generation, a continued and perpetual motion is requisite, so to the vicissitude of generations and corruptions it is requisite that there should be two motions, the one direct, the other oblique, which is the motion of the planets through the zodiac. The continuity, therefore, and perpetuity of motion is the cause that generations are continued and perpetual. The obliquity of the zodiac is the cause that the sun and the other planets that are moved through the zodiac, sometimes approach to, and sometimes recede from us. And the access and recess of the sun is the cause of generation and corruption. For that which he generates by his access, he corrupts by his recess. Because, however, the sun frequently accedes and recedes, he frequently generates and frequently corrupts.

[4] From what has been above said, it follows, in the first place, that because the time in which the sun accedes is equal to the time in which he recedes, therefore the time of generations is equal to

asserted. For we see that when the sun approaches, there is generation; but when he departs, corruption. Each of these too takes place in an equal time; for the time is equal of generation and corruption. It frequently however happens that things are corrupted in a less time, on account of their mixture with each other; for matter being anomalous, and not every where the same, it is also necessary that generations should be anomalous, and that some should be swifter but others slower. Hence it will happen that through the generation of these, other things will be corrupted. But as we have said, generation and corruption will always be continual, and will never fail, through the cause which we have assigned. But this reasonably happens. For since in all things we say that nature always aspires after that which is better; but it is better to be than not to be; and in how many ways *to be* is predicated, has been shown by us elsewhere; but it is impossible that this should be the case in all things, on account of being far distant from their principle;—hence in that way which remains, divinity gives completion to the whole of things; viz. by making generation to be unceasing. For thus especially will existence be continual; because for generation to be *always* passing into existence, is most near to essence. But the cause of this, as has been frequently said, is the lation in a circle; for this alone is continual. Hence such other things as change into each other, according to passive qualities and powers, such for instance as simple bodies, imitate the lation in a circle. For when air is generated from water, and fire from air, and again, water from fire, we say that generation has made a circular progression, in consequence of returning to that whence it began. Hence also the right-lined lation of these, imitating the la-

to the time of corruptions. In the second place it follows, that the time or duration, and life of all things, are measured by the number of the celestial motions according to the order of the universe. But all time is measured by the circulation of a celestial body, though things do not endure for an equal time, but some more and others less. For some things endure for a year, and therefore are measured by one circuit of the sun through the zodiac; others endure for a shorter time, and therefore are measured by a less circuit, as by the circuit of the moon if they endure for one month, or any number of months within a year; or by the circuit of the primum mobile, if they endure for one day, or any number of days within a month.

tion in a circle, is continual [5]. At the same time too, from these things that which is doubted by some is evident, why, since every body tends to its proper place, composite bodies are not in an infinite time separated from each other; for the cause of this is their mutation into each other. For if each of them remained in its own region, and was not changed by the element which is near it, they would already have been divulsed. They change therefore on account of a twofold lation; but in consequence of changing, no one of them can remain in any arranged place. That generation therefore and corruption exist, and on account of what cause, and what the generable is, and also the corruptible, is evident from what has been said.

It is however necessary there should be something which moves, in order to the existence of motion, as has been before elsewhere observed; and if motion is perpetual, it is necessary there should be something which perpetually moves. In like manner if motion is continual, that which first moves is one, immoveable, ingenerable, and unchanged in quality; and if there are many circular motions, it is necessary there should be many movers indeed, but all of them in a certain respect under one principle. But time being continued, it is also necessary that motion should be continued; since it is impossible for time to exist without motion. Time therefore will be the number of some continued motion. Hence it will be the number of circular motion, as has been shown in the discussions in the beginning. But whether is motion continued from that which is moved being continued, or from that in which it is moved, I say, for instance, the place; or the passive quality? It is evident, however, that it is from that which is moved being continued. For how is passive quality continued, except from the thing to which it is an accident being continued? But if it is continued from that in which it is moved, this can alone be inherent in place; for it possesses a certain magnitude. Of the motion in place, however, that alone which is circular is continued; so that itself is always continued with itself. This therefore is that which makes motion to be continued, viz. the body which is moved in a circle; but motion makes time to be continued and perpetual[6].

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[5] The generations of the elements are so effected, that air is produced from water, and fire from air, and again water from fire. Hence matter returns to the form of water, whence it began to be moved; and therefore the generation of the elements imitates a circular motion. The rectilinear motion of the elements also imitates a circular motion. For in the summer, when the sun approaches to us, the inferior are changed into the superior elements, viz. into vapours and exhalations, and are moved upward; but in winter the superior are changed into the inferior elements, and being resolved into rain, are returned to the downward place.

Since however in things which are continually moved according to generation, or change in quality, or in short mutation, we see that which exists in a consequent order, and this thing generated after that, so as not to fail; it must be considered whether there is any thing which will exist from necessity, or nothing, but it may happen that all things may not be generated. For that this may be the case with some things is evident; and immediately the *will be*, and that which is about to be another thing, are on this account. For in order to say truly that a thing will be, it is necessary that it should be some time or other true that it is; but nothing hinders that a thing of which it is now true to say that it is about to be, may not be generated; for he who is about to walk, may not walk. In short, since it happens that some things may be and may not be, it is evident that generated natures will thus subsist, and this will not be from necessity. Whether, therefore, are all things thus circumstanced, or not? But it is necessary that some things should be simply generated; and as it is with respect to existence, that it is impossible for some things, but possible for others, not to be, thus also is it with respect to generation. Hence it is necessary that conversions as it were should be produced, and that it is not possible that this should not happen.

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[6] The celestial motion is continued, because a celestial body is continued and circular. For a celestial body is not in place except from accident; and therefore the celestial motion cannot have its continuity from place, but from the body alone which is moved, For motion has not continuity except from a subject; for since quality or accident cannot be continued, except because the subject to which it is an accident is continued, thus also alliation, which is a motion in quality, is continued on account of the subject. Hence local motion can alone have continuity from that in which it is. All local motion however cannot be continued and perpetual, but circular motion alone. Circular motion therefore is continued and perpetual, on account of a circular body; but time is continued and perpetual, on account of circular motion.

If therefore that which is prior must necessarily have been generated, if that which is posterior will be; for instance, if a house will be built, it is necessary that the foundation should have been previously laid; and if this, that prior to it, there should have been clay;—if this be the case, will it also be necessary, if the foundation is made, that the house should be built; or will it no longer be necessary, unless it is simply necessary that the foundation should be laid? But if this be admitted, it is also necessary that the foundation being laid, the house should be built; for thus the prior subsists with reference to the posterior; so that if the latter will be, it is necessary that the former should have a prior subsistence. If, therefore, it is necessary that the latter, it is also necessary that the former should be generated; and if the former, it is also necessary that the latter should be generated, yet not on account of that, but because it was supposed that it would be from necessity. In those things, therefore, in which it is necessary that the posterior should be, in these conversion takes place; and always when the prior is generated, it is necessary that the posterior should be generated[7]. Hence if generations proceeded infinitely downward, it would

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[7] All beings have not a necessary subsistence, but some things exist in such a manner as that they may not exist; and these latter are so generated that they may not be generated. Hence all beings are not necessarily generated, but some are so generated that they might not be generated. Aristotle therefore enquires whether all things which are made are made contingently, so that they might not be made; or whether some things are so made, that simply they cannot not be made, and therefore whether as some things so exist, that they may not exist, and other things so exist that they cannot not exist, so some things are made and generated in such a manner, that they may not be generated, but others are so made and generated, that they cannot not be generated, and therefore a conversion is given between things prior and posterior, so that as if the posterior is made, it is necessary that the prior should be made, so if the prior is made, it is also necessary that the posterior should be made. Thus, for instance, as if a house is built, it is necessary that the foundation should be laid, so if the foundation is laid, is it necessary that the house should be built?

In answer to this question, it must be observed, that in order to the subsistence of conversion it is not sufficient that if the posterior exists, it is necessary the prior should exist, but it is further requisite that the posterior should be absolutely and simply necessary, so as that it cannot not be admitted. Thus, in order that conversion may subsist, it is not sufficient that if the house is, it is necessary the foundation should be laid, but it is further requisite that it should be would not be necessary that this which is posterior should be simply generated; neither would it be necessary from hypothesis; for there will always be another thing before it from necessity; on which account, that also must necessarily have been generated. Hence if there is not a beginning of the infinite, neither will there be any first thing, on account of which it will be necessary that a thing should be generated. Moreover, neither in things which have an end, will it be true to assert this, that it is simply necessary a thing should be generated, as for instance a house, when the foundation is laid. For when it is laid, unless it is always necessary that the house should be built, it will happen that what may not always be, always is[8]. But it is necessary to generation that it should always be, if the generation of it is from necessity; for a subsistence from necessity, and the always, are simultaneous; since that which necessarily is, cannot possibly not be. Hence, if

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be simply and absolutely necessary that the house is. For then, it will not only be necessary, that if the house is, the foundation should be laid, but also that if the foundation is, the existence of the house must be necessarily admitted, since it is absolutely necessary that the house should exist. Hence in this case, the prior existing, it is necessary that the posterior should be generated, since the posterior is absolutely necessary; but when the posterior is not absolutely necessary, it is not always necessary that the prior existing, the posterior should be generated.

[8] Generation is infinite circularly, so as to return to the same thing, but it is not infinite according to a right line. For generation according to a right line cannot be necessary, neither if the things which are arranged in a right line are finite, nor if they are infinite. They cannot be necessary if when arranged in a right line they are infinite; for in things which are thus arranged, it is necessary that before that which is posterior, that should exist which is prior; just as it is necessary that before the house exists, the foundation should be laid. But in infinites a first cannot be given. Hence if the things which are arranged in a right line are infinite, there cannot be a first; but a first not existing, it is impossible that any one of the rest should be assigned, and therefore it is not necessary that any one of the things posterior should be admitted. Hence generation will not only not be necessary, but impossible. But neither can generation be necessary, if the things which are arranged in a right line are finite. For a foundation and a house are arranged in a right line, since a house supposes a foundation, but a foundation does not imply the existence of a house. Hence, if those things being finite, which are arranged in a right line, generation were simply necessary, or from hypothesis, a house would necessarily be generated, either simply, or from the hypothesis of a foundation. We see however that the generation of a house, as well simply, as from the supposition of a foundation, is a thing contingent. Hence that would necessarily be generated, which from experience is evidently generated contingently, and not necessarily.

if a thing is from necessity, it is perpetual; and if it is perpetual, it is from necessity. If generation, therefore, is from necessity, the generation of this also is perpetual; and if perpetual, it is from necessity. Hence, if there is simply a generation of something from necessity, it is necessary that it should move in a circle, and revert[9]. For it is necessary that generation should either have an end or not. And if not, that it should either proceed in a right line, or in a circle. But of these, if generation will be perpetual, it is not possible it can proceed in a right line, because it would by no means have a beginning. Neither therefore will it be perpetual, if it proceeds downward, as we assume in things that will be hereafter; nor if it proceeds upward, as in things which are generated. Not being finite, however, it is necessary that it should have a beginning, and that it should be perpetual. Hence it is necessary that it should proceed in a circle. It will be necessary, therefore, that a reversion should take place. Thus, for instance, if this particular thing is from necessity, that also which was prior to it was from necessity; but if this, it is also necessary that what is posterior should be generated. And this must always and incessantly take place; for it makes no difference to assert that this is effected through two, or through many things. That which is simply from necessity therefore is in a circular motion and generation; and if in a circle, it is necessary that every thing should be generated, and should have been generated; and if this is necessary, the generation of these will be in a circle[1].

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[9] It has been before observed, that it is necessary corruptible essences should always exist, not indeed in the same number, but in the same species. But they could not always exist, unless generation always existed, through which when one thing perishes, another like it supplies its place. That however which always exists is necessary. For the eternal and necessary are so converted, that what is eternal is necessary, and what is necessary is eternal. Generation therefore is always, and has a necessary existence. It could not however be always and necessarily if it was arranged in a right line. Hence generation is not arranged in a right line, but circularly, so that it may infinitely return to the same thing.

[1] The necessity that generation should be circular may be briefly shown as follows, and the efficient cause also may be assigned why generations subsist circularly, so as often to revert to the same thing. For it is necessary that generation either should have an end, and some time or other

But these things reasonably are so, since it has elsewhere appeared that the motion in a circle and the motion of the heavens are perpetual, because these are generated and will be from necessity, whatever motions there are of this, and whatever subsists on account of this motion. For if that which is circularly moved, always moves something, it is also necessary that the motion of those things which it moves should be circular. Thus for instance, if the upward lation is circular, the sun will be circularly moved. But because the sun is thus moved, on this account the seasons also will revolve in a circle, and revert. And these thus subsisting, all other things will be circularly moved from these.

Why therefore do some things appear to be thus generated in a circle, as for instance, water and air, for if there is a cloud, it is necessary there should be rain, and if it rains, it is necessary there should be a cloud; but men and animals do not revert into themselves, so as that the same man or animal is again generated? For it is not neces-

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other cease, or that it should not have an end, but always endure. Admitting, therefore, as has been demonstrated, that generation cannot have an end, but ought always to endure, it is necessary that it should either be in a right line, so as never to return to the same thing, or that it should be circular, so that it may infinitely return to the same thing. It has however been shown to be impossible that if generation is in a right line, it should be infinite either upward or downward, since if it were, neither a first thing nor a last could be given. But that which is first being taken away, all that is posterior will be taken away. Hence it is necessary that generation should be circular, so that it may return infinitely to the same things. In this circular generation, therefore, if that which is posterior is, it is necessary that what is prior should exist, and if that which is prior exists, it is necessary there should be that which is posterior, and thus to infinity, so that causes the same in species may be circularly prior and posterior. Thus if the earth is moistened by rain, it is necessary that rain should precede. If rain precedes, it is necessary that clouds should precede. And if there are clouds, it is necessary that vapours should ascend from the earth. And if vapours ascend, it is necessary that the earth should be moistened. Hence there is now a regression to moistening which rain precedes, so that clouds may precede rain, elevated vapours may precede clouds, moistening of the earth may precede elevated vapours, and thus generation may be rendered perpetual, by recurring in a perpetual circle to the same things, through many, or through fewer media. If therefore generation is circular, it is necessary that every thing which was will also be hereafter, in something similar in species, and every thing which will be had in like manner an existence before. And, on the contrary, if every thing which was will be in something similar in species, and if every thing which will be was in something specifically similar, it is necessary that generation should be circular.

sary if a father is generated that you should be generated: but if you are, it is necessary that he should be. But this generation appears to be in a right line. The beginning of the consideration is however again this, whether all things similarly revert, or not, but some things in number and others in species alone. It is evident, therefore, that those things whose essence being moved is incorruptible, will be the same in number; for motion follows that which is moved. But such things whose essence being moved is corruptible, necessarily revert in species but not in number. Hence water is from air, and air from water, the same in species, but not in number. And even if these were the same in number, this will not be the case with those things the essence of which is generated, and which is of that kind that it may not exist[2].

CHAPTER VIII.

LET us in the next place direct our attention to the reason assigned by Aristotle why the sun heats us though it is itself not hot, and also to his doctrine concerning comets; for we shall find that his reasoning on both these subjects is no less admirable for its accuracy, than estimable for its truth. In the third chapter, therefore, of the first book of his treatise on Meteors, he writes as follows:

" We say, therefore, that fire and air, water and earth, are generated from each other, and that each of these exists in each in capacity; just as in other things, in which one and the same thing exists as a subject, into which also they are ultimately resolved[3]. In the first place then, it may be doubted about what is called the air, how we ought to conceive of its nature in the world which comprehends the earth, and what the order is which it possesses with respect to what are called the other elements of bodies. For the magnitude of the bulk of the earth with respect to the comprehending magnitudes is not immanifest; since we have already seen through astrological theorems, that it is much less than some of the stars[4]. But neither do we see the nature of water collected and separated, nor does it happen that it is separated from that body which is established about the earth; such as from the sea and rivers which are apparent, or from any thing which may be unapparent to us in the depths of the earth. With respect however to the space which is between the earth and the last stars, whether should we think that it contains one body, or many bodies according to nature; and if many, what is their number, and to what extent are they bounded by places? About the first element, therefore, we have before shown[5], what kind of power it possesses, and that the whole world which subsists about the upward lations is full of that body. And not only we have this opinion, but it appears to be an ancient doctrine, and to have been entertained by men prior to the present time. For what is called æther has received an ancient appellation, by which Anaxagoras appears to me to signify, that he thought it to be the same with fire. For the upward places are full of fire; and he conceived that the power which is there should be called fire; in this indeed thinking rightly. For they appear to have thought that the body which is always running is naturally something divine, and they determined to denominate such a body æther, as not being the same with any one of the bodies which are with us; since we should not say, that the same opinions have once or twice, or rarely been circulated among men, but that this has taken place infinitely. Those however who say, that the nature which surrounds us, and not only the revolving bodies, is pure fire, but that the space between the earth and the stars is air, these if they had sufficiently surveyed through the mathematical sciences what is now shown, would perhaps have been liberated from this puerile opinion. For it is very simple to think that each of the revolving bodies is small in magnitude, because it appears so to us surveying it from hence. We have before however observed in the theorems about the upper place, and we shall now repeat the same argument, that if the intervals are full of fire, and the celestial bodies are composed from fire, each of the other elements would long ago have been annihilated. Nor are they alone filled with air; for the air would much exceed the equality of the common analogy which it has with its co-ordinate bodies. And this would also be the case, though the place between the earth and the heaven were filled with two of the elements. For the bulk of the earth, in which all the multitude of water is contained, is, as I may say, no portion (of the universe) if compared with the magnitude of that which surrounds us. But we do not see that an excess of bulk is produced in so great a magnitude, when from water being secreted air is generated, or fire from air. It is necessary, however, that the whole of water should have the same ratio to the whole of air, which a small portion of water has to the air produced from it. But it makes no difference, if it should be said, that these are not generated from each other, and yet that they have equal powers. For after this manner, it is necessary that equality of power should be inherent in their magnitudes; just as if they were generated from each other. Hence it is evident that neither air nor fire alone fill the intermediate place.

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[2] Those things which are so circularly moved, as not to be essentially corrupted, return to the same thing in number; and because the celestial bodies are so circularly moved, that they are not essentially changed, they return to a place numerically the same, and to motions the same in number, at least through continuation. On the contrary, those things which are so moved as to be corrupted in essence, do not return to the same thing in number, but only to the same thing in species. Thus when air is produced from water, and water again from air, water not numerically, but alone specifically the same, is produced. And even if it should be admitted that the elements return numerically the same, yet animals are never generated numerically the same, but only the same in species.

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[3] Aristotle latently proceeds to the proximate elements. For having said that these four elements change into each other, the mutation being effected according to that which is in capacity in each, he obscurely signifies the semi-generic elements. For how could these be collectively changed, unless through the semi-generic elements, viz. the two exhalations, as a medium? For the vaporous exhalation is between air and water; and the fuliginous is between fire and earth. These however are the material principles; but the producing principle is innate heat, which exists both in earth and water.

[4] By *what is called air*, Aristotle means the whole of that interval which extends from the earth, as far as to the last of the stars. Olympiodorus adds, But why does he denominate this interval *air*, and why *that which is called air*? He denominates it air indeed, because some have thought that the *υπεκκαυμα*, or inflammable matter at the summit of the air, as being invisible, is air. But he denominates it *that which is called*, because in reality the inflammable matter is not air, but another element. If however we admit that the inflammable matter is air, we shall subvert the existence of the most beautiful of the elements, fire, which is of a vivific nature. Olympiodorus adds, that formerly the discussion of the heavens, astronomy and astrology, were considered as one science; the first of these indeed, teaching the essence of the stars; the second the motion of them; and the third their effects. Aristotle therefore calls astronomy, astrology; but Plato in the Timaeus calls physiology, astronomy.

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[5] That is to say, in the treatise On the Heavens. For there Aristotle enquires about the fifth body, and demonstrates what the essence of it is, and that all the celestial bodies are composed from it.

It remains, therefore, in addition to the above-mentioned doubts, that we should show how the two elements air and fire are arranged with respect to the position of the first body; and through what cause heat is generated in the places about the earth from the supernal stars. Hence speaking in the first place about the air, according to our hypothesis, we shall thus also again speak about these things. If therefore water is generated from air, and air from water, what is the cause that clouds do not consist in the upward place? For it is more fit that they should by how much the more remote and cold the place of the earth is, in consequence of neither being so near the stars which are hot, nor near the rays reflected from the earth, which prevent clouds from being collected near the earth, in consequence of separating their assemblage through heat. For collections of clouds are there produced where the rays now end, because they are scattered into the immense tracts of air. Either therefore water is not naturally adapted to be generated from all air, or if similarly from all air, that which is about the earth, is not only air, but is as it were a vapour. Hence it is again collected into water. Moreover, if the whole air being of so great an extent were vapour, the nature of air and water would seem much to exceed, if the upward intervals are full of a certain body. And it is impossible indeed that they should be full of fire, because every thing else would be dried up. It remains therefore, that they must be filled with air, and that all the region about the earth is filled with water. For vapour is a separation of water. About these things, therefore, let it be doubted after this manner. We however shall enter on the discussion, at the same time concluding with respect to what is about to be said, and to what is now said. For that which is upward, and extends as far as to the moon, is we say a body different from fire and air. In this upward region, however, one thing is more pure, but another less genuine. They also have their differences; and especially that part of this region, which ends in the air, and the world about the earth. But the first element being moved in a circle, and the bodies which it contains, that which is proximate of the downward world and body, being separated by motion, is always inflamed, and produces heat. It is requisite however thus to conceive, from hence assuming a beginning. For the body which is under the upward circulation, being as it were a certain matter, in capacity hot, cold, dry, and moist, and possessing such other passive qualities as are consequent to these, becomes a thing of this kind, from motion and immobility, the cause and principle of which we have before assigned. The heaviest and the coldest bodies, therefore, viz. earth and water, exist separated in and about the middle. But about these, and adhering to these, air, and that which through custom we call fire, though it is not fire; for fire is the excess, and, as it were, fervor of heat. It is necessary however to understand with respect to that which is called by us air, that the part of it which is about the earth, is as it were moist and hot, in consequence of its evaporating, and possessing an exhalation of earth; but the part which is above this, is now hot and dry. For the nature indeed of vapour, is moist and hot; but of exhalation hot and dry. And vapour, indeed, is in capacity, as it were water; but exhalation is in capacity as it were fire. That clouds therefore are not formed in the upward region, this must be considered as the cause, viz. that not air alone is there, but rather fire. Nothing however hinders, but that clouds may be prevented from being formed in the upper region on account of the motion in a circle. For it is necessary that all the air should flow circularly which is not received within the bounding circumference, which causes the whole earth to be spherical. For the generation of winds is now also seen in stagnant places of the earth, and the winds are not elevated above the highest mountains. But the air flows circularly, because it is drawn along together with the circulation of the universe. For fire is in continuity with the upward element, and air with fire; so that air on account of the circular motion is prevented from being collected into water; but whatever part of it becomes heavy always tends downward, the heat being thrust out into the upward place, while another part is elevated together with the exhaling fire; and thus continually one place remains filled with air, and another with fire, and each of them is always varied. And thus much has been said by us to show that clouds are not formed in the upward region, and that air is not collected into water, and also in what manner it is requisite to conceive of the place between the stars and the earth, and with what body it is filled[6].

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[6] The doubt here mentioned by Aristotle is, why clouds are not formed in the upper region of the air, though they ought rather to be formed there because the air in the upper region is colder. Why however clouds are not formed there, we shall learn, says Olympiodorus; and history testifies that they do not exist in that region. For Alexander Aphrodisensis says, that in Cyllene, there is a most lofty mountain upon which sacrifices were performed, and that letters which were written in the ashes remained unobliterated for a whole year; since no wind blew upon its summit. For above the mountain there is neither vapour nor moisture; but beneath, in the air about the earth, clouds are formed: Such then is the doubt, the true solution of which is as follows: The *υπεκκαυμα* or inflammable matter at the summit of the air, is the cause why clouds are not formed in the upper region of the air. For since this inflammable matter is hot, it heats the air which is near to, more than that which is remote from it; and on this account, as there is not condensing cold in the upper region of the air, clouds are not formed there. Some one however may perhaps doubt why on the contrary the air which surrounds the earth is hotter on account of the friction of the solar rays, but there is much cold in the loftiest mountains, so that the air in the upper region is cold in the extreme. What then shall we say? That the air which surrounds the earth, on account of the friction from the solar rays, is vehemently hot, and with a heat which is *rather caustic than vivid;* but the air in the upper region is rather hot with a vivific heat. He also adduces another cause, through which clouds are not formed in the upper region of the air, viz. that vapour on account of its gravity, not being able to reach thither, falls to the earth. Since, therefore, neither the material cause, viz. an aqueous essence, nor the producing cause, viz. cold, is in the upper region of the air, hence clouds are not formed in that region. Aristotle also mentions another cause of this, viz. that the air in the upper region is in a perpetual flux, and is moved in conjunction with the motion of the universe. For a cloud requires rest, in order that concretion may take place. Hence since the air in the upper region is moved

With respect however to the generated heat imparted by the sun, to speak of it by itself and accurately, rather belongs to the discussions about sense; for heat is a certain passive quality of sense. Nevertheless we must now also show on what account it is generated, though the celestial bodies have not a nature of this kind. We see then that motion is capable of separating and inflaming the air, so that through motion bodies are frequently seen to be melted. The motion of the sun therefore alone is sufficient for the generation of warmth and heat; for it is necessary to this purpose that the motion should be swift, and not very remote. The motion of the stars is indeed swift, but remote; and that of the moon is downward [i. e. near], but slow. The motion of the sun, however, possesses both these requisites sufficiently. It is reasonable indeed, that heat should be generated together with the sun itself, if we assume a similitude from things which are effected with us. For here when certain things are moved by violence, the neighbouring air becomes very hot. And this very reasonably happens; for the motion of a solid especially separates the air. From this cause, therefore, heat arrives as far as to the place of our abode; and also because the circumambient fire frequently dissipates the air by its motion, and violently tends downward. But falling stars sufficiently indicate that the upward region is not hot, nor ignited. For they are not generated in that region, but downward; though bodies which are more moved, and more

moved in a circle, neither are winds produced in it; for their motion which is oblique is destroyed by the circular motion of the universe. For the motion in a circle is not the cause of the motion of the winds; since if they were moved in a circle, all of them would be eastern. But the motion of all of them is oblique except the motion of the east wind: for this tends from the east to the west. Perhaps, however, Olympiodorus adds, some one may doubt why the air which surrounds the earth, does not revolve in conjunction with the universe. The answer is, that it is prevented from being moved in this manner by the caverns and cavities of the earth. In short, clouds are not generated either in the upper region of the air, or in the downward part of the air which surrounds the earth. They are not generated in the former, because the producing and material cause, viz. vapour and cold, are not present, but the motion in that region is always most vehement. And they are not generated in the latter, because cold which is the producing cause is not present; for there is abundant heat in the region which immediately surrounds the earth, in consequence of the conflux in that place of the solar rays.

swiftly, are more rapidly set on fire. To which we may add, that the sun, which especially seems to be hot, is seen to be white, and not of a fiery colour[7].

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[7] Aristotle now assigns the cause why the sun not being hot, heats us. And he might indeed, says Olympiodorus, have solved the doubt by saying, that there is no absurdity that what is not hot should heat. For every thing which is hot heats, but not every thing which heats is hot. Thus motion, which is not itself hot, heats; and according to Plato figures heat, not being hot themselves. For in the Timæus he says, that fire heats, in consequence of the invisible figures from which it is composed being pyramidal; since these in consequence of terminating in a sharp point are capable of dividing with facility. Hence he thought that these pyramids burn, from the facility with which they divide. Aristotle then might in this way have solved the doubt; which however he does not, but omitting this solution, investigates what causes the celestial bodies to heat us. He says, therefore, that the inflammable matter at the summit of the air, and the upper region of the air itself, being moved together with the heavenly bodies, are heated, and afterwards heat us. But that the upper region of the air is moved in conjunction with the universe, is evident from comets rising together with the planets themselves. If however some one should say, that comets have an alternate change, we reply, that this arises from the upper region of the air not being entirely able to follow the universe. And if a comet at one time appears smaller, and at another larger, this happens from the adjacent matter feeding the previously inflamed air. But the same comet, at one time becomes more southern, and at another more northern. If however this is the case, and the upper region of the air is moved in conjunction with the motion of the universe, why do not all the spheres heat us, but alone the sphere of the sun? To this we reply, that all the spheres indeed heat us, but that of the sun more than the rest, because it is moved commensurately and rapidly, and the sun is at a commensurate distance from us. For the inerratic sphere, though it is moved with incredible celerity, in consequence of the magnitude of its orb, yet at the same time it is at a great distance from us, and on this account does not heat us. But the orb of the sun having a middle situation, and being at a commensurate distance from us, has also a commensurate celerity, and on this account heats us. Perhaps however it may be doubted, why that which the inerratic sphere does not effect in consequence of its distance, it does not effect from its celerity? The answer is, that being remote, though it is moved rapidly, it by no means heats; as neither does that which is near when it is not moved rapidly, unless this power is attributed to it. But perhaps some one may doubt, if heat is produced from the solar sphere, why we are not similarly heated by night as by day? To this we reply, that not only the sphere in which the sun is fixed is the cause of heat, but also the sun himself. For his rays being reflected become the cause of abundant heat in the day. Not that his rays are reflected in the way some one may fancy. For how can they be reflected in reality, since they are in themselves incorporeal? But they illuminate the air, and this being vivified, and supernaturally moved, is reflected, desiring to participate still more abundantly of life. Hence being reflected and multiformly moved, it is heated. Perhaps, however, it may again be doubted, why we are not similarly

These things being discussed, let us show through what cause, burning flames, falling stars, and what are called by some torches and goats, are seen about the heaven. For all these are the same thing, and originate from the same cause; but they differ in the more and the less. The principle however of these, and of many other things, is as follows: The earth being heated by the sun, exhalation is necessarily produced, not simple, as some fancy, but twofold; one being more vaporous, but the other more pneumatic: one indeed being the vapour of that moisture which is in and upon the earth; but the other being a smoaky exhalation of the earth when dry. And of these, the smoaky emerges and becomes supereminent, on account of heat, but the exhalation which is more moist subsides, on account of its gravity. And hence the circumambient is on this account adorned. For in the first place under the circular motion of the heaven, are the hot and the dry, which we call fire[8]; for that which is common in every smoaky separation is anonymous. At the same time because such a body is especially adapted to be inflamed, it becomes necessary thus to use ap-

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milarly heated in summer and in winter, or in the morning and at noon. We reply, that this is because the rays of the sun in summer and at noon are direct; but in winter and the morning they are oblique. But it is demonstrated that the angle of incidence is always equal to the angle of reflection. Reflections however at right angles, more compress the air, and on this account the air is more heated in summer. But in winter, in consequence of the reflections being oblique, the air is not compressed but diffused; and on this account there is not much heat.

Two causes, therefore, have been assigned of heat. It now remains to assign a third cause, which is the inflammable matter at the summit of the air. For by violence a part of it sparkles, and tends downward. Olympiodorus concludes with justly observing, that if the sun was hot, it would be most intensely hot, in consequence of burning at so great a distance. But if this were the case, it ought to be as red as a burning coal; for that which is vehemently caustic has the appearance of a burning coal. Not indeed that every thing which has this appearance is caustic. For the moon has the appearance of a red hot coal, and yet is not caustic. But every thing which is caustic has this appearance; for in the fire a red hot coal is more caustic, than a coal which is hot but not red.

[8] The υπεκκαυμα, or inflammable matter at the summit of the air, is not properly called fire, but metaphorically from its ministrant office. But that is not called fire which does not burn. Olympiodorus adds, that hence the υπεκκαυμα is so denominated from burning less; for the addition of the υπο implies diminution.

pellations. But under this nature is air[9]. It is necessary however to understand, that this which we now call fire, being as it were an inflammable matter, (υπεκκαυμα) is extended about the extremity of that sphere which surrounds the earth; so that from a small motion it is frequently inflamed like smoke. For flame is the fervour of a dry spirit. Such a matter, therefore, when it has been in a certain respect moved by the circular motion, is inflamed in that part in which it is especially adapted to be so. It differs, however, according to the position or multitude of the inflammable matter. For if the inflammable matter has length and breadth, a burning flame is frequently seen, like burning reed in a field. But if it has length only, then it forms what are called torches, goats, and falling stars. And if indeed the inflammable matter is greater in length than in breadth, when it twinkles as it were while it burns, (and this happens because it is inflamed gradually indeed, but at the beginning) then it is called a goat; but when it is without this passive quality, then it is called a torch. If however the length of the exhalation is gradually and multifariously dispersed, and similarly according to breadth and depth, then those stars are generated which appear to fall. At one time, therefore, the exhalation beingi nflamed by the motion generates these; but at another time, heat is expelled and separated by the air formed from refrigeration. Hence their motion is more similar to projection than to burning. For it may be doubted whether the falling of a body of this kind, is not produced just as the smoke of a recently extinguished lamp is enkindled into a flame, by a burning lamp placed over it; (for the rapidity of this is wonderful, and resembles projection, but is not as if another and another fire was produced) or whether it is projection. It seems however to be produced in both these ways. For this exhalation is produced in the same manner as the flame of a lamp, and some things are projected because they are expelled, just as kernels which are thrust out from between the fingers;

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[9] That is to say, after the inflammable matter is air, which is easily enkindled from a small motion, if it meets with fit matter. For to effect this, not only motion is necessary, but also the material cause.

gers; so that they are seen to fall into the sea, and on the earth, both by night and by day, when the sky is serene. But they are hurled downward, because density propelling, causes them to verge downward. Hence also thunder falls downward. For the generation of all these is not inflammation, but a separation from expulsion; since all heat naturally tends upward. Such falling stars, therefore, as are rather formed in the highest place, are produced in consequence of the exhalation being inflamed; but such as are produced in the lower region, are formed from secretion, in consequence of the more moist exhalation being collected together and refrigerated. For this being collected and verging downward, propels being inspissated, and makes the projection of heat to be downward. But from the position of the exhalation, in whatever manner it may happen to have breadth and depth, it thus tends, either upward or downward, or obliquely. For the most part, however, it tends obliquely, because it is moved with two motions; by violence indeed downward, but naturally upward. For all such things are moved according to a diameter. Hence for the most part, the lation of falling stars is oblique. But the cause of all these, as matter indeed is exhalation, but as that which moves, at one time it is a motion upward, but at another the congelation of mingled air. All these too are generated beneath the moon; a token of which is the apparent celerity of their motions, which is similar to that of bodies which are thrown by us, and which because they are near to us, appear to be moved much swifter than the stars, the sun and the moon.

Sometimes also by night, when the sky is serene, many appearances are seen to be formed in the heaven; such as chasms, pits, and bloody colours; of all which there is the same cause. For since the air which is formed in the upward region is inflamed, and this inflammation is at one time such as to exhibit the appearance of a burning flame, but at another of moving torches and shooting [or falling] stars, no absurdity will follow, if the same air being collected should be tinged with all-various colours. For a lesser light shining through a more dense medium, and the air receiving refraction, produce all-various colours, but especially a red or purple colour, because these colours especially appear to be produced from a mixture of the fiery and white, the one being placed upon the other; such as are the rising and setting stars, which if it is summer, and when seen through smoke, appear to be of a red colour. Colours also may be produced from reflection, when the mirror is of such a kind as not to receive figure but colour. Why these however do not continue for a long time, is owing to the rapid dissolution of the matter from which they are formed. But chasms are formed from light being broken through the intervention of an obscure and black vapour, which causes it to have the appearance of a certain profundity. Frequently also from things of this kind torches fall, when they happen to be more concrete; but when the vapours are collected a certain chasm appears to be formed. In short, the white in black produces many varieties, just as flame does in smoke. By day, therefore, the sun prevents these apppearances from being formed, but the rest, except that which has the red colour, do not appear by night, in consequence of similitude of colour. Concerning falling stars, therefore, and ignited bodies, and farther still, concerning other such like appearances as produce rapid imaginations, it is necessary to assign these as the causes."

CHAPTER IX.

Of comets, Aristotle delivers his opinion as follows:

"Let us however speak concerning comets, in the first place doubting with respect to what has been said by others. Anaxagoras therefore and Democritus assert that comets are a joint appearance of the planets, when in consequence of approaching towards, they appear to touch each other. But some among the Italians, and who are called Pythagoreans, say, that a comet is one of the planets; but that it does not appear for a long time, and that it is at no great distance from the sun, which is also the case with the star of Mercury. For because it departs but a little from the sun, it does not often appear, but is only visible after a long time. Similar to these assertions also are those of

Hippocrates Chius, and his disciple Æschylus, except that they do not say it has a tail from itself, but that while it wanders it sometimes acquires it from the place in which it moves, our sight being refracted by the moisture attracted by it towards the sun. Because, however, it most slowly recedes from the sun, it does not again appear till after a long time, so that when it is seen from the same place, it has receded from the sun the whole of its circle. They add, that it is deserted by the sun towards the north, and towards the south; and hence, that in the place between the tropics, it does not attract water to itself, because that region is burnt by the motion of the sun; but that when it tends to the south, it has an abundance of such moisture. Because, however, the section of the circle which is above the earth is but small, and that which is beneath is manifold, our fractured sight cannot reach to the sun, neither when he approaches to the (southern) tropic nor when he is in the summer solstice. Hence when he is in these places, he does not produce a comet. But when the planet recedes to the north, it acquires a tail, because the circumference which is above the horizon is great; but the part of the circle which is beneath is small. For then our sight can easily reach as far as to the sun [1]. In all these opinions, however,

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[1] Aristotle delivers the doctrine about comets in three parts. In the first, he narrates the opinions of others about them. In the second, he confutes these opinions. And in the third he delivers the true, or in other words his own opinions about them.

The first opinion is that of Anaxagoras and Democritus, who said that a comet is nothing else than the appearance of many planets, which sometimes are so near, that they seem to be in contact, and to coalese in one star.

The second opinion is that of certain Pythagoreans, who asserted that a comet is one of the planets, which nevertheless but rarely appears, and not till after a long time. For since it departs but a little from the sun, it is seldom seen, just as it happens to the planet Mercury, which from its constant vicinity to the sun, is rarely visible.

The third opinion is that of Hippocrates Chius, the inventor of the quadrature of the lunulas, and of his disciple Æschylus. These indeed assert, together with the authors of the second opinion, that a comet is one of the planets, but they add that it has not a tail from itself, but acquires a tail in its progression, by attracting moisture, or a humid vapour from the place in which it moves, which reflecting or refracting the light of the sun to our eye, or, in the language of the ancient opticians, reflecting or refracting the visual ray to the solar body, causes the appearance of however, it happens that some impossibilities are asserted in common, but others separately. In the first place, therefore, it must be observed, in answer to those who say that a comet is one of the planets, that all the planets recede from the sun in the zodiac, but many comets are seen out of this circle. In the next place, more than one are frequently generated at the same time. To which may be added, that if comets have a tail on account of refraction, as Æschylus and Hippocrates say, it would be requisite that this star should sometimes appear without a tail, since it recedes indeed from the sun, and is seen in other places; and it would not every where have a tail. Now however no planet is seen beside the five stars; and all these are frequently seen at one and the same time elevated above the horizon. And when all of them are visible, and all of them are not visible, but some are near the sun, yet comets nevertheless frequently appear to be generated. Besides, neither is this true, that a comet is alone generated in the north-

of a tail. From these principles, therefore, they endeavour to account for the phænomena pertaining to comets. And in the first place they say that the reason why a comet is rarely seen is because it very slowly recedes from the sun, and is then only apparent when it is distant from the sun. For when it is near to the sun it is prevented from being seen by us, by the immense light of that luminary; and hence a comet cannot be seen except after a long interval of time. In the second place, they say that the reason why a comet is alone seen without the tropic of Cancer, which verges to the north, is because when it is within the tropic in the torrid zone, and when it is beyond the tropic of Cancer, it cannot be seen. Hence it is necessary that it should then alone be seen, when it is without the tropic of Cancer in the nothern part. But the reason why it cannot be seen when it is within the tropics in the torrid zone, is because a comet, in order that it may be seen, ought to be surrounded with vapours reflecting or refracting the light of the sun, and thus causing a tail. In the torrid zone, however, vapours sufficient for this purpose cannot be attracted, because this zone in consequence of being burnt by the sun, cannot administer a sufficient quantity of such vapours. The reason also, according to them, why a comet cannot be seen when it wanders beyond the tropic of Capricorn in the southern part, is because the vaporous sphere to the south, since the greater part of it with respect to us is beneath the horizon, cannot sufficiently reflect to us the light of the sun, when the sun is about the tropic of Capricorn, as is requisite in order to cause the appearance of a tail. But when the comet is in the northern part about the tropic of Cancer, then also it attracts a sufficient quantity of vapours: and because the greater part of the vaporous northern sphere is with respect to us above the horizon, the light of the sun may be sufficiently reflected and refracted to our eye, as is requisite in order to produce the tail of a comet.

ern parts, and when at the same time the sun is about the summer solstice. For the great comet which was seen about the time of the earthquake in Achaia, and the inundation of the sea which then happened, rose from the equinoctial west[2]; and many comets are now generated towards the south. But when Eucleus the son of Molon was the Athenian archon, a star with a tail was seen towards the north, in the month January, the sun being about the winter solstice; though they also say it is impossible so great a refraction should have taken place. It is common however to these, and to those who say that a comet is a conjunction of planets, in the first place that some of the fixed stars have a tail; and in this, it is not only proper to believe the Egyptians, (for they assert this to be the case) but we ourselves have seen it. For a certain star among those in the thigh of the dog has a tail, though it is obscure; for to those indeed who look intently upon it, an obscure light is produced, but a greater when it is beheld less intently. To which may be added, that all the comets that are seen in our time, have disappeared in the place above the horizon without setting, becoming so gradually consumed, that neither the body of one, nor of many stars, has been left. For that great star which we have before mentioned, appeared in winter, when there was ice, in a serene sky in the evening, Aristæus being the archon. And on the first day indeed, it was not seen, in consequence of setting prior to the sun: but on the following day it was seen, as much as possible. For it receded very little from the sun, and immediately set. But the light of it extended like a forest, as far as to the third part of heaven; whence also it was called a path. It ascended however as far as to the belt of Orion, and was there dissolved. But Democritus strives to defend his own opinion; for he says, that on the dissolution of comets certain stars have been seen. This however ought not to take place sometimes, and sometimes not, but should always happen. To this may be added, that the Egyptians also say that there is not only a congress of the planets among themselves, but also with the fixed stars; and we ourselves have twice seen the star of Jupiter enter into Gemini and disappear, but it did not become a comet. This also is evident from reason. For the stars though they appear greater and less, yet at the same time they appear to be by themselves indivisible. As therefore, if they were indivisible, they would not by coming into contact with any magnitude render it greater, thus also, since they are not indivisible, but appear to be so, they are not seen by their congress to produce any greater magnitude. That the causes, therefore, which have been enumerated about them are false, though not through many arguments, yet through these, is sufficiently evident.

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[2] i. e. Due west.

Since, however, about things unapparent to sense, we think that we sufficiently demonstrate according to reason, if we reduce them to that which is possible, from what now appears to be the case, some one may conceive, that we should determine about these things as follows: It has been supposed by us, that the first part of the world, about the earth, which subsists under the circular motion of the heaven, is a dry and hot exhalation; and this, and also much of the air which is in continuity under it, is convolved about the earth, by the lation and motion in a circle. But being borne along and moved after this manner, whatever it meets with that is of a proper temperature, is frequently inflamed; and hence we say that the falling of scattered stars is effected. When therefore this exhalation falls into such a condensation, which is a fiery principle, on account of the motion of the upward bodies, and is neither so very much as to burn rapidly and for a long time, nor so imbecil as to be rapidly extinguished, but is abundant and endures for a long time, but at the same time it happens that an exhalation of a proper temperament ascends from beneath, this star becomes a comet, according as that which is exhaled may happen to be figured. For if it is every way similarly figured, it is a comet; but if oblong, it is called bearded. But as a lation of this kind appears to be the lation of a star, in like manner its permanency appears to be the permanency of a star. For that which takes place is just as if any one should throw a torch or a spark of fire into a heap of straw; since the shooting of the stars appears to resemble this. For on account of the aptitude of the inflammable matter, it is diffused into length. But if this continues, and is not consumed in its course, in that part in which especially the inflammable matter is condensed, the beginning of the lation will be the end of the course. For such is a comet, being as it were the course or shooting of a star, containing in itself a beginning and end. When therefore the beginning of the formation is in the downward place, the comet appears by itself. But when the exhalation though motion consists under some one of the fixed stars, or planets, then some one of these becomes a comet. For a tail is not produced in the stars themselves. But as halos appear about the sun and the moon, and follow their course, though these stars change their place, when the air is so condensed, that this passive quality is produced under the progression of the sun, thus also a tail is as it were a halo to the stars; except that the halo possesses its colour from refraction, but the tails contain in themselves the colour which they exhibit. When, therefore, such a concretion is made according to some star, then it is necessary that the comet should appear to be moved with the same motion as the star; but when it subsists by itself, then it appears to be left behind; for of this kind is the motion of the world about the earth. For this especially indicates that a comet is not a certain reflection, like a halo produced in pure inflammable matter, about a star itself, or as Hippocrates says, about the sun; because a comet is often produced by itself, and more frequently than about certain definite stars. Concerning the cause of the halo, therefore, we shall hereafter speak; but that the nature of comets is fiery, it is requisite to think this is an argument, that if they are numerous they signify winds and droughts. For it is evident, that they are produced because a secretion of this kind is abundant; so that it is necessary the air should be more dry, and the elevated moisture be so separated and dissolved, through the abundance of hot exhalation, that it may not easily be collected into water. We shall, however, speak more clearly about this passive quality, when we have occasion to speak about winds. When, therefore, as we have said, comets appear to be crowded together and numerous, the years become remarkably dry and windy; but when they are less frequent, and their magnitude is more obscure, then a thing of this kind is not effected. For the most part, however, a certain excess of wind is produced, either according to time, or according to magnitude; since when the stone in Ægospotamos fell from the air, being elevated by the wind, it fell in the day; but it happened at that time, that a comet was seen in the evening. About the time also, in which that great comet appeared, the winter was dry, and the wind northerly, and an inundation of the sea was produced in consequence of the contrariety of the winds. For the north wind prevailed in the bay, and a great south wind blew out of it. Farther still, when Nichomachus was the Athenian archon, a comet was seen for a few days about the equinoctial circle. It did not, however, rise from the west, and during its continuance, a great wind was produced about Corinth. But the reason why comets are not produced in abundance and frequently, and why they are rather produced without, than within the tropics, is the motion of the sun and the stars, which not only attenuates heat, but separates that which is formed. But the principal cause is, that in the region of the galaxy the stars being numerous, a greater quantity of exhalations are collected[3]."

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[3] Aristotle having narrated the false opinions about a comet, proceeds to relate the true, which is his own opinion about it. Since, however, says Olympiodorus, we know that a comet exists, but do not know how it is generated, let us unfold what the law is respecting things the generation of which is unapparent. It is as follows: That we should assume certain hypotheses, which are attended with no impossible consequence. For thus Aristotle defines accident to be that which has no existence by itself, but from which being admitted nothing impossible follows.—We may also say, according to Plato, that the object of investigation is either this, or a thing of this kind. Of the generation of a comet, therefore, it is necessary to pre-assume certain hypotheses, of which nothing impossible is the consequence. But the hypotheses are these. First, that the summit of the sublunary world, viz. of the air, is convolved together with the universe. Secondly, that this summit, as it consists of inflammable matter, is set on fire. Thirdly, that the enkindling of it, ought neither to be most vehement, nor so obscure as to be weak, vanquished and extinguished. But that which is most vehement is extinguished on account of the failure of the matter; for it is rapidly consumed. In the fourth place, it is necessary there should be a gross matter, in order that it may remain burning for a longer time. In the fifth place it is necessary that smoke adapted to it should ascend from the earth. The generation of a comet follows from these five hypotheses.

CHAPTER X.

The two very important dogmas of Aristotle which next demand our attention are these, that in very extended periods of time, the sea becomes continent, and the continent sea, and that the sea is unbegotten and perpetual, and is the *principle*, or, in Platonic language, the *wholeness* (ολοτης) of all water. Of the first of these dogmas, therefore, Aristotle writes as follows towards the end of his first book On Meteors.

"The same places of the earth are not always wet or dry, but they are changed according to the generations and failures of rivers. Hence, places about the continent are changed, and also those about the sea, and some parts do not always remain land, but others sea, through the whole of time, but where there was land, sea is produced; and where

hypotheses. For a comet is generated in the upper region of the air, which is filled with inflammable matter, and is convolved together with the universe, as is evident from its rising and setting with the same stars. It is also an accension, as is evident from its fiery nature. And it is neither a most vehement, nor a most obscure accension, as is evident from its continuing for some length of time. It is likewise formed from a more gross matter, as is again evident from the time of its duration. A smoke also adapted to it ascends from the earth; as is evident from the same comet not being always produced, but only when the smoky exhalation abounds. And this is the first generation of a comet. The second generation is that of a falling star distributing an appropriate matter: for in this case the accension meeting with a more gross matter is stopped, and forms a comet. And this accension Aristotle says is the beginning and end of a star; for it becomes indeed the end of a falling star, but the beginning of a comet. There are also different figures of comets, conformable to the different accension of the matter. For the accension is either according to length only, and not also according to breadth, and then what is called a beam is produced. Or it is both according to length and breadth, and then it is properly a comet. Or in its depth, it has as it were certain sparks, and is then called bearded. Hence, there are three differences of comets. But of these, some appear to have for their beginning a constellation or a star, and others subsist by themselves. *For when a comet happens to be perpendicular to any constellation or star, then the sight extending itself as to a more splendid star, through the brightness of the comet, conceives that the summit of the comet is the star;* but when it is not perpendicular, then it is seen by itself. The comet, however, which is produced about a star, or a constellation, is properly called a comet.

there is now sea, there will again be land. Yet it is requisite to think that these changes take place according to a certain order and period. The principle and cause, however, of these mutations are this, that the inward parts of the earth, in the same manner as the bodies of plants and animals, have their acme and old age; except that to the latter these things do not happen according to a part, but it is necessary that the whole should at once arrive at its acme, and at once decay; but to the earth this happens according to a part, on account of heat and cold. These, therefore, increase and diminish from the sun and its circulation. Hence also the parts of the earth receive a different power, so that its aqueous parts are able to remain for a certain time, and afterwards become dry, and again grow old; but other places are vivified, and become aqueous according to a part. It is necessary however that when places become more dry, fountains should disappear; and when these things happen, rivers in the first place from being great become small, and afterwards become at length dry. But when rivers are changed, disappearing indeed here, but being generated analogously in other places, the sea is necessarily changed. For where the sea being impelled by rivers superabounded, there when it recedes it is necessary that it should make dry land; but where abounding with streams it becomes dry, there when it is again spread abroad, it becomes stagnant. In consequence, however, of all natural generation about the earth subsisting from succession, and in a very great length of time with respect to our life, we are ignorant of these mutations; and entire nations are destroyed and corrupted, before these changes are remembered from beginning to end. The greatest and the most rapid corruptions, therefore, are produced from war, but others from diseases, and others from sterility; and of these some are indeed great, but others gradual, so that we are ignorant of the transmigrations of such nations, because regions are deserted by some, but others remain in them till the place is no longer able to furnish nutriment for any number of mankind. From the first desertion of a country, therefore, to the last, it is likely that such long periods of time should intervene as that no one can remember these mutations; but being yet preserved, those who remain become ignorant of them through length of time. After the same manner it is requisite to think oblivion is produced of the time in which the several nations began to inhabit their respective countries, and of the period in which these regions from being marshes and aqueous became dry. For here an increase is effected gradually in a long time; so that it is no longer remembered who were the first inhabitants, and when they settled, and what was the condition of the places when they came to inhabit them; as happened to be the case about Egypt. For this place always seems to become more dry, and the whole region is an inundation of the river Nile. Because, however, the neighbouring places began to be inhabited, in consequence of the marshes becoming gradually dry, the length of time has obliterated the beginning. All the mouths of the Nile, therefore, except one, the Canobic, appear to have been made by the hand, and not to have been formed by the river. Formerly also Egypt was called Thebes, as is evident from Homer, who existed so recently, as I may say, after such like mutations. For he makes mention of that place, as if Memphis did not yet exist, either altogether, or was not then so large as at present. But it is likely that this should happen. For places in a low, were inhabited posterior to those in an elevated situation. For it is necessary that those places which are nearer to the mud accumulated by the river, should be for a longer time marshy, because the water always stagnates more in the extremities. This, however, is changed, and again passes into a prosperous mode of subsistence. For places becoming dry, arrive at a good condition. But places which formerly possessed a good temperament, when they become dry then become worse, which happened to Greece, and about the region of the Argives and Mycenæans. For in the time of the Trojans, the country of the Argives, in consequence of being marshy, could only afford aliment for a few inhabitants, but Mycene was in a good condition, and on that account was more honourable. Now, however, for the cause abovementioned, the contrary takes place; for Mycene has become barren and entirely dry; but the country of the Argives, which was then barren, in consequence of being marshy, has now become fertile. Hence, that which has happened in this place which is small, the same it is necessary to think happens about larger places, and entire regions[4].

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[4] The thing now proposed by Aristotle, says Olympiodorus, is to show that the parts of the earth change according to dryness and moisture, from being moist becoming more dry, and from being dry becoming moist. But moisture being triple, viz. either potable, or salt, or marshy, he shows that all moisture changes into dryness. For that earth changes from potable moisture into dryness, and from dryness into potable moisture, is evident from the disappearing and appearing of rivers. For places which were formerly aqueous have now become dry, and those which were formerly dry now abound with moisture. And this happens indeed with respect to potable moisture. It also happens with respect to salt or marine moisture. And that this is true is evident from the continent becoming sea, and the sea becoming continent. This, however, Olympiodorus adds, happens, in consequence of what is called *the great winter*, and *the great summer*. But *the great winter* is when all the planets become situated in a wintry sign, viz. either in Aquarius, or in Pisces. And *the great summer*, is when all of them are situated in a summer sign, viz. either in Leo, or Cancer. For as the sun alone when he is in Leo, causes summer, but when he is in Capricorn, winter, and thus the year is formed, which is so denominated, because the sun tends to one and the same point, (*εναυτος*), for his restitution is from the same to the same;—in like manner there is an arrangement of all the planets effected in long periods of time, which produces the great year. For if all the planets becoming vertical heat in the same manner as the sun, but departing from this vertical position refrigerate, it is not unreasonable to suppose that when they become vertical, they produce a great summer, but when they have departed from this position, a great winter. In this great winter therefore, the continent becomes sea; but in the great summer the contrary happens, in consequence of the burning heat, and there being great dryness where there was moisture. Aristotle also assigns another cause of the sea becoming continent, and the continent sea. For rivers in running into the sea, by the mud which they bring with them, form shores, and thus that place becomes land; but when they do not run into the sea, they cause the land to become sea. Except that rivers, both when they run, and when they do not run into the sea, produce each of these changes, yet not after the same manner. For if a river should happen to run into the sea about the southern part, the sea becomes continent. In this case, however, it is necessary that the sea should be impelled to the opposite continent, and that continent become sea. And this happens indeed if a river runs into the sea. But if it does not, the water again returns to its proper place; and thus that which was formerly sea becomes continent, and that which was formerly continent becomes sea. That the sea however becomes continent, and the continent sea, Aristotle evinces from Egypt. For formerly it was sea; and the Nile always bringing with it fresh mud, (whence also it was called Nile) which became accumulated in the oblique parts of the river and the sea, from the addition which by this means was gradually made, the sea at length became a continent. Hence Herodotus calls Egypt the *gift* of the Nile; but Aristotle calls it the *work* of the Nile. And Aristotle denominates it better than Herodotus, because he calls it by an agricultural name; for the Nile as it were cultivates Egypt. Not

Those therefore who look to that which is small, fancy that the cause of such like mutations is the change of the universe, as if the heaven were generated. Hence they say the sea becomes less, as being dried, because now more places are seen to be thus affected than formerly. This however is partly true, and partly not true. For there are many places which were formerly covered with water, but are now land. The contrary however is also true. For if they had directed their attention to many places, they would have found that the sea has occupied the land. It is not however requisite to fancy that the generation of the world is the cause of his. For it is ridiculous to move the universe on account of small and momentary mutations. But the bulk and magnitude of the earth are nothing compared with the universe. We should conceive

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Not indeed that Herodotus uses an unappropriate name; for the Egyptians possess the formation of their land as the gift of the Nile.

But that Egypt was formed from the mud accumulated by the Nile, Aristotle shows from three arguments. First, that all the mouths through which the Nile exonerates itself into the sea, except the Canobic (or Canopic) were made by the hand, viz. by human art, and not by the river. Hence it is a sign that these mouths were open by men, and that they excavated the channels of the river, in order that the Nile thus flowing more easily into the sea, a great part of the region which was occupied by that river, and was marshy, might be dried and rendered habitable. But that the Canopic mouth, says Olympiodorus, is not the work of the hand is evident; since Menelaus in the course of his voyage sailed into it; whence also it was called Canopic, from Canopus, the pilot of Menelaus. The second argument is, that Egypt was anciently called Thebes; and this is an indication that formerly the upper part of Egypt in which Thebes is situated, was alone inhabited, but that the upper part was added by the Nile, and gradually began to be dried and inhabited. The third argument is from Homer, who so speaks of the Memphitic region, as if it did not then exist, or at least as if the whole of it did not exist. This therefore is a sign that all that part of Egypt, which is extended from Memphis as far as to the sea, was made after the time of Homer by the inundation of the Nile. But it reasonably happens that places nearer to the sea, as being lower, are more slowly left by the sea, and afterwards for some time remain marshy, till being gradually dried they become habitable.

It is also well observed by Olympiodorus, that the reason why acme and old age do not happen to the bodies of plants and animals according to a part, but the whole at once suffers these changes, while this happens to the earth according to a part, on account of heat and cold, is in order that between things perfectly perpetual, and things perfectly corruptible, there may be a certain medium, which is neither corruptible according to the whole, nor incorruptible according to the whole. Acme and decay however do not simply follow from cold and heat, but also from dryness and moisture.

however that the cause of all these things is this, that as winter is produced in the seasons of the year, so in destined times, in a certain great period, there is a great winter, and an excess of rain. This however does not always happen in the same regions, but takes place just as that did which is called the deluge of Deucalion[5]. For this happened principally about Greece, and especially ancient Greece; and this is about Dodona and Achelous. For this river has in many places changed its stream. For the Selli dwelt there, and those who were then called Greeks[6], but now Hellenes. When therefore there is such an excess of rain, it is requisite to think that it is sufficient for a long time. And as now some say that the cause why certain rivers are perennial and others not, is the magnitude of chasms under the earth, so we say that this arises from the magnitude of elevated places, and their density and cold; for these receive, cover and produce a great quantity of water. But when the mountains suspended over rivers are small or fungous, stony and argillaceous, then it is necessary to think that those rivers previously fail in which there is such a motion of humidity, that they are more able to render the humidity of places perennial. These however in the course of time appear to become more dry, but the others which are aqueous, become less dry, till the same period again accedes. But since it is necessary that there should be a certain mutation of the whole, though not a generation and corruption of it, since the universe remains, it is also necessary, as we say, that the same places should not always be wet from the sea and rivers, and dry [from the absence of these]. That also which has happened evinces the truth of this. For the whole region of the Egyptians whom we assert to be the most ancient of men, appears to have been made, and to be the work of the river Nile, as is evident to those who survey that country. This also is sufficiently indicated by places about the Red Sea. For one of the ancient kings endeavoured to dig through this; since if the whole place were made navigable, it would procure them no small advantages. Sesostris is said to have been the first of the ancient kings who attempted this, but he found the sea to be higher than the earth. Hence he first and Darius afterwards, desisted from digging, in order that the stream of the river might not be corrupted, by being mingled with the sea. It is evident, therefore, that all these were one continued sea. Hence the parts about Lybia, the Ammonian region, are seen to be more low and hollow than the nature of a place remote from the sea requires. For it is evident that from mud being collected pools and dry land are formed; and the stagnant water which is there left becoming in the course of time dry, entirely disappears. The bottom also of the lake Mæotis has become so much increased by the inundation of rivers, that ships of merchandize of a much less magnitude sail in it now than sixty years ago. Hence it is easy to infer from this, that as from the first most lakes, so that of Mæotis, is formed by rivers, and that at length the whole of it will necessarily become dry. Farther still, the Bosphorus always flows indeed, in consequence of being inundated, and it may yet be seen after what manner this happens. For when the river had made a shore from Asia, that which was behind was made a lake, which was small at first, and afterwards became dry. Afterwards another shore was formed from this, and a lake from the shore, and this will always happen in a similar manner. But this frequently taking place, it is necessary in the course of time, that a river as it were should be formed, and that at length this should become dry. It is evident therefore, since time will never fail, and the universe is perpetual, that neither the river Tanais, nor the Nile, has always flowed, but that the place whence they flow was once dry. For their work has an end, but time has not. It is fit also to assert this in a similar manner of other rivers. Since however rivers are generated and corrupted, and the same places of the earth are not always aqueous, it is also necessary that the sea should be similarly changed. But some parts of the sea always receding, and others always acceding, it is evident that the same parts of the earth are not always some of them sea, and others continent, but all these are changed in time[7]. And thus we have shown why the same parts of the earth are not always dry land, nor always navigable; and in a similar manner, why some rivers are perennial, and others not."

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[5] In the Introduction to my translation of the Physics of Aristotle, I was mistaken in supposing that Simplicius in speaking of the deluge, meant the Ogygian deluge; for I am now persuaded he meant that of Deucalion.

[6] *γραικοι*. This word, says Olympiodorus, the Romans mark with an acute accent in the penultimate syllable, calling it *γραίκοι*. He adds, But universally the Romans mark every noun in this way in consequence of their arrogance and ostentation; whence they are called by the poets "beyond measure proud."

CHAPTER XI.

THAT the sea is unbegotten and perpetual, and that it is the *wholeness* of water, is thus demonstrated by Aristotle in the 2d book of his treatise On Meteors.

"The ancients and those who employed themselves about theological concerns, make fountains of the sea, in order that they may be the principles and roots of the earth and sea. For thus perhaps they apprehended that what is said would be more tragical and venerable[8], as if this were a certain great portion of the universe; and all the rest of the world subsisted about this place, and for the sake of this, as being most honourable and the principle. But those who are more wise according to human wisdom assert that the sea is generated[9]. For they say that the whole place which is about the earth was at first moist, but being dried by the sun, one part being converted into vapour produced blasts of wind, and the revolutions of the sun and moon, and that the remaining part is the sea. Hence they fancy that the sea by being dried [by the sun] becomes less, and that at length the whole of it will become dry. But some of them say that the earth being heated by the sun, sweat is as it were produced; and that on this account the sea is salt; for sweat also is salt. Others again say that the earth is the cause of the saltness of the sea. For as water which is percolated through ashes becomes salt, after the same manner also the sea is salt, from an earth of this kind being mingled with it.

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[7] Aristotle, says Olympiodorus, having shown that the parts of the earth change according to dryness and moisture, and more according to the former than the latter, in consequence of his having lived after the deluge of Deucalion, now cuts off the suspicion of the multitude. For some one of these may think that since the earth is changed according to a part from a more moist to a more dry condition, all the earth will at length be changed and corrupted, and that on this account the whole world is corruptible. For in the first place, if certain parts of the earth become dry, others become aqueous. And the truth of this is testified by the great philosopher Ammonius. For he says that the land has become sea for five stadia about Heraclea and Canopus, as is evident from habitations which still remain in the middle sea, and which resemble islands. In the next place, it is not fit from what happens about the earth, to infer that the like will also happen to the heavens, compared with which the earth may be said to be without magnitude; for it has the relation of a point to them. And why do I say compared with the heavens, for the sun himself, which appears to be but a foot in diameter, on account of his distance from the earth, is demonstrated to be one hundred and seventy times larger than the earth. It is not proper, therefore, to infer from the earth that the world will be corrupted; but it is necessary to assign as the cause of the mutation of the earth according to a part from an aqueous to a more dry condition, *the great winter*, of which we have before spoken. For when this happens, a part of the earth being deluged, a change then takes place to a more dry condition, till *the great summer* succeeds, which however does not cause the corruption of all the earth. For neither was the deluge of Deucalion mundane; since this happened principally in Greece.

That it is impossible, however, there should be fountains of the sea, it is necessary to survey through things which actually exist. For of the waters which are about the earth, some are flowing, and others are stagnant. All flowing, therefore, are fontal waters. Concerning fountains, however, we have before observed, that it is necessary to conceive a fountain as a principle, not from which, as a vessel, water is derived, but as that in which water when generated and confluent is always first collected. But of stagnant waters some are a collection of many kinds and subsiding, such as the waters of marshes and lakes, which differ in multitude and paucity. Other stagnant waters are fontal; and all these are produced by the hand. I mean, for instance, what are called well-waters. For it is necessary that the fountain of all these waters should be higher than their stream. Hence some flow spontaneously, such as fontal and river waters; but others require the assistance of art. Such, therefore, and so many are the differences of waters. These things, however, being thus determined, it is impossible there should be fountains of the sea; since it is not possible that the sea can be in any one of these genera of waters. For it can neither be effluxive, nor made by the hand. But all fontal waters are either one or the other of these. We do not, however, see that any quantity of fontal water so great as this, becomes spontaneously stagnant. Farther still, since there are many seas which are not in any place mingled with each other, of which the Red Sea appears to communicate but in a small degree with the sea beyond the pillars of Hercules, but the Hyrcanian and Caspian sea are separated from the external sea, and are surrounded with inhabitants;—this being the case, the fountains could not be concealed if they existed in any of those habitable places. The sea, however, appears to flow in narrow places, wherever in consequence of the surrounding earth it is collected into a small from a great deep; because it is frequently in equilibrium. But this in a great extent of sea is immanifest. If, however, in consequence of the narrowness of the earth, it obtains a small place, it is necessary that the small libration in the deep should there appear to be great. But all the sea which is within the pillars of Hercules flows according to the cavity of the earth, and the multitude of rivers. For the lake Mæotis flows into the Euxine sea, and the Euxine into the Ægean sea. All the seas, however, external to these, manifestly effect this in a less degree. But this happens to them, both on account of the multitude of rivers, (for more rivers flow into the Euxine sea and the lake Mæotis, than into the more ample region of the sea) and their deficiency in depth. For there the sea is always seen to be more deep. Thus the Euxine Pontus is deeper than the lake

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[8] Aristotle, says Olympiodorus, properly uses the words *more tragical.* For Euripides says that the sun, and in like manner the heaven, were generated on account of the earth, conceiving the earth to be a great portion of the universe, contrary to astronomers, who say that the earth has but the relation of a point to the whole heaven. Other theologists also speak in a similar manner, among whom is Hesiod. For they suppose the earth to be a great portion of the universe, on account of the lunar mountains, which they say nearly touch the lunar sphere.

[9] Aristotle here speaks about the natural philosophers who supposed the sea to be generated according to its saltness. But he properly says *human wisdom*; i. e. *human science*, or in other words, *physiology*.

Mæotis, the Ægean than the Euxine, and the Sicilian than the Ægean, sea; but the Sardonic and the Tyrrhene seas are the deepest of all[1]. *The seas, however, which are beyond the pillars of Hercules are not deep on account of the mud which they contain*[2]; and they are unruffled by the wind, in consequence of the sea being in a hollow. As, therefore, rivers are seen to flow according to a part from lofty places, thus also from the more lofty places of the whole earth, there is an abundant stream towards the north; so that these seas, on account of the effusion, are not deep, but the external seas have a greater profundity. That the parts of the earth, however, situated towards the north are elevated, is indicated by this, that many of the ancient meteorologists were persuaded, that the sun is not moved under the earth, but about the earth, and this place; and that he disappears and produces night because the earth is elevated towards the north. Such and so many things therefore have been said by us to show, that it is not possible there can be fountains of the sea, and from what cause it thus appears to flow.

The cause, therefore, which induced our ancestors to suspect that the sea is the *principle* and *body* of all water is this[3]; that it seems to be reasonable, as of the other elements there is a collected bulk, and a principle on account of multitude, from which a part, when divided, is changed and mingled with other things; as of fire, there is a collected bulk in the upper region; of air, in the place after fire; and of earth there is a body about which all these are evidently situated;—this being the case, it is manifest that we must necessarily investigate for the same reason [a collected bulk] about water. There appears, however, to be no other collected body of this kind, as there is of the other elements, except the magnitude of the sea. For that of rivers is neither collected nor stable, but is seen to be generated every day. From this doubt, therefore, the sea has been thought to be the principle of moisture and all water. Hence also, some say that rivers not only flow into this, but also from this; for according to them the salt water being percolated becomes potable. But to this opinion another doubt is opposed, why this collected body of water is not potable if it is the principle of all water, but is salt? The cause, however, of this doubt, will at the same time be the solution of it; and it is necessary that the first opinion about the sea should be rightly assumed. For water being extended about the earth, in the same manner as the sphere of air is extended about water, and what is called fire about air; (for this is the last of all, whether as most, or as we say) but the sun revolving after this manner, and mutation, generation, and corruption subsisting on this account, the most attenuated and sweet part of water is elevated every day, and being separated from the whole, is evaporated into the upper region. But there being again condensed on account of cold, it again tends downward to the earth; and this is what nature always wishes to effect, as we have before observed. Hence all those prior to us are ridiculous who apprehended that the sun is nourished by moisture; and some also say that on this account he revolves. For according to them the same places are not always able to furnish him with nutriment;

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[1] Aristotle here, says Olympiodorus, attacks the major proposition which affirms that every thing which flows has fountains; since this is false. For the sea, says Aristotle, external to the pillars of Hercules, viz. the ocean, is stable; but the sea within the pillars, viz. the Caspian, is fluent. For it flows from more elevated land into cavities, viz. from the more northern into the more southern parts. All rivers also run into this as into a cavity. Whence too, converting the influxions into land, they render the part of this sea towards the north more elevated, so that on this account it flows more to the southern parts. For many rivers indeed pour themselves into the lake Mæotis, whence also it is in parts converted into earth. The lake Mæotis again pours itself into the Euxine sea, and this last flows into the Ægean sea, as being more hollow. And again, the Ægean flows into the Sicilian, and the Sicilian into the Sardonian and Tyrrhene seas, which are more hollow than all of them. The sea, therefore, is fluent from position, and not from fountains. It may be enquired, however, how the more northern parts of the sea are more elevated in consequence of rivers pouring into it from thence, though the Nile which is a great river flows from the southern parts? To this Olympiodorus replies, that the Nile also flows from the northern parts; for it flows from the habitable part of the globe which is in an opposite direction.

[2] Agreeably to what is here said by Aristotle, Plato also in the Timæus says, that the Atlantic sea was in his time innavigable, arising from the gradually impeding mud, which the subsiding Atlantic island produced. See p. 470, vol. ii. of my translation of Plato's works.

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[3] By the *principle* and *body* of all water, and also by the expression *collected body* of water, Aristotle evidently means what Plato calls the *whole* or *wholeness* of water.

triment; but it is necessary that he should either be nourished or corrupted. For visible fire lives as long as it has nutriment; but moisture is alone the nutriment of fire. As if the moisture which is elevated from the earth reached as far as to the sun, or as if its ascent was like that of flame: from which assuming a similitude, they formed this opinion about the sun. There is not, however, this similitude. For flame through continual moisture and dryness which are changed, is generated, and not nourished; for it does not, as I may say, remain for any time the same. It is impossible, however, that this should happen about the sun; since if it were nourished after the same manner, as they say, it is evident that there is not only a new sun every day, as Heraclitus asserts, but that there is always a new sun continually. Farther still, the elevation of moisture by the sun resembles water heated by fire. If, therefore, the fire under the water is not nourished by the water, neither is it fit to think that the sun is nourished by moisture, not even though by his heat he should evaporate the whole of water. It is also absurd that they should alone pay attention to the sun, and overlook the safety of the other stars, though they are so numerous and of so great a magnitude. The same absurdity, however, happens to these, and to those who say that the earth being at first moist, and the world about the earth being heated by the sun, the air was generated, and the whole heaven increased, and that this produced winds, and caused the revolutions of the celestial bodies. For we evidently see that water which is elevated always again descends; and though it is not annually restored, and in a similar manner, in every region, yet all the assumed water is restored in certain orderly periods of time; so that neither are the bodies on high nourished; nor does one part of the air remain after its generation, and another part is generated, and again corrupted into water; but in a similar manner the whole is dissolved, and again condensed into water. The whole, therefore, of potable and sweet water is elevated on account of its levity; but salt water subsides on account of its gravity, as in its own proper place. For we must admit that this was appropriately doubted; since it would be absurd that water should not have a place, as well as the other elements; and we must conceive this to be the solution of the doubt. For that place which we perceive to be occupied by the sea, is not the place of the sea, but rather of water. But it appears to be the place of the sea, because that which is salt subsides on account of its gravity, but that which is sweet and potable is elevated on account of its levity, in the same manner as in the bodies of animals. For in these, though sweet aliment enters, yet that which is the sediment and excrement of moist aliment, is seen to be bitter and salt. For that which is sweet and potable, being attracted by the innate heat, passes to the flesh, and to the other parts, according to the natural condition of each. As, therefore, in the body of an animal, it is absurd not to think that the belly is the place of potable aliment, because such aliment rapidly disappears, but that it is the place of excrement, because this is seen to remain, and he who is of this opinion does not conceive well; the like also must be said in the present case. For the sea, as we have before observed, is the place of water. Hence likewise, all rivers run into it, and all generated water. For the flux is into that which is most hollow, and the sea obtains a place of this kind in the earth. The whole, however, of one part of water is rapidly elevated on account of the sun; but another part is left behind from the above-mentioned cause[4].

But

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[4] Aristotle now investigates whether the sea is the wholeness of water; and he shows that it is through four arguments, the first of which is as follows: The other elements have wholenesses to which aspiring they tend. It is not reasonable, therefore, to suppose that water alone has not a wholeness. But if water has a wholeness we must investigate what it is. It is, therefore, by no means rivers. For it is adapted to a wholeness to be continued; but rivers are not continued; for they have not a collected body of water. Hence rivers are not the wholeness of water, but the sea, as being continued, and having water collected together and not separated. And here we may observe that from this dogma of Aristotle, it follows that the sea is continued and not divided, as geographers assert it to be. And if it should be said that seas are not continued, but divided from each other, we reply that it is not absurd that the parts of the sea should be in other places, because all things are in all. Thus though the wholeness of fire is in the inflammable matter at the summit of the air, yet there are fountains of fire under the earth, because all things are in all. Again, it is not possible that rivers can be the wholeness of water, since they are fluent; but the

sea

But to enquire according to the ancient doubt, why so great a quantity of water is never apparent, since innumerable rivers, and of an immense

sea is stable; and stability is adapted to a wholeness. The sea, therefore, on account of its stability is the wholeness of all water, and not rivers. If, however, Aristotle has before said that the sea is fluent, yet it is not fluent in the same way as rivers. For they flow elsewhere, viz. into the sea; but the sea flows only into itself. Nor let it be said (Olympiodorus adds) that as the inflammable matter at the summit of the air which is the wholeness of fire is moved, there is not stability in a wholeness. For though this inflammable matter is moved, yet it is moved with a circular motion; since perpetuity belongs to wholenesses; and those things perpetually remain, which either stand still, or are moved in a circle. And this is the first argument.

The second argument is as follows: The sea is evidently the wholeness of water, since all river water aspiring after its wholeness, hastens into the sea; for parts love to be conjoined to their wholes. Thus wee see that a clod of earth aspiring after the earth, viz. after its proper wholeness, again returns to it. The third argument is this: The place which is the subject of water is the recipient of all water, both salt and potable; but the peculiarity of a wholeness is to receive the whole of water. If, however, it should be said, why does not the sea contain potable water? We reply, that so far as pertains to the sea, it contains potable water, but that in consequence of the daily evaporation arising from the sun and moon, and the other stars, it does not. The fourth and last argument is as follows: The characteristic of water, as water, is to hasten into the most hollow place of the earth; and that this is the sea is evident. For all rivers hasten into it. Through these four arguments, Aristotle infers that the sea is the wholeness of water.

Olympiodorus afterwards adduces certain doubts against this doctrine, and also solutions of the doubts, as follows: Since all wholenesses are according to nature, but the sea is contrary to nature, for it is salt, the sea, therefore, is not the wholeness of water. To this it must be replied, that the sea is not salt contrary to nature; for if this were the case, it would be sweet according to nature. Water, however, which subsists according to nature is void of quality. Hence, sweetness and saltness are not according to nature in water. For it is natural to water to be cold and moist, which are tangible and not gustible qualities. Another doubt is the following. Sea water is contrary to nature; since to refrigerate and to moisten is the property of all water; but the sea does not produce these effects: for it heats and dries, and, therefore, is not the wholeness of water. To this doubt we reply, that the sea does not heat and dry of itself, but from a fuliginous exhalation being conjoined with it; since so far as pertains to itself, it contains potable water; but potable water refrigerates and moistens. And that the sea so far as pertains to itself contains potable water is evident. For if any one digs trenches about the shore, he will find them filled with potable water; from which it is evident that the water in passing from the sea, being percolated in the trenches, is freed from the fuliginous exhalation which is mingled with it; since it is only superficially, and not profoundly united with it. Afterwards Aristotle converts himself to the third problem, in which he investigates the cause of the saltness of the sea. And he admits indeed mense magnitude, daily flow into the sea, and yet the sea does not become in any respect greater;—to make this the subject of doubt is not indeed at all absurd, yet it will not be difficult for him to see the cause of this, who considers the affair with attention. For the same quantity of water when widely diffused and when collected, will not be dried in an equal time, but there will be so much difference, as that the latter will remain for a whole day, but the former, just as if any one should spread abroad the water in a bowl, on a large table, will wholly disappear while the spectator is beholding it. And this also happens about rivers. For since all of them continually flow, that quantity of water which arrives at an immense and broad place, becomes rapidly and invisibly dry. What, however, is written in the Phædo about rivers and the sea is impossible. For it is there said that all the cavities which are under the earth have a communication with each other; and that what is called Tartarus is the principle and fountain of all water, this being a certain quantity of water about the middle, from which all flowing and stagnant water is derived. That it also flows into each of the streams, because that which is the first and the principle perpetually fluctuates; for it has no seat, but is always rolled about the middle; and being moved upward and downward, pours itself into the streams of rivers. That some of the streams of Tartarus also, in many places become stagnant, as is the case with our sea; but that all of them are again circularly led back to the principle, whence they began to flow; many indeed, according to the same place, but some according to a place contrary in position to that from which they flowed. Thus for instance, if they began to flow from beneath, they enter from above. That there is likewise a descent as far as to the middle; for the remaining course to all of them is in an ascending direction. That the taste

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indeed the reason assigned for it by the ancient philosophers, not as simply the cause of the saltness of the sea, but as a concause of the things asserted by them. For they say that the sea is salt, because the most attenuated part of it is daily evaporated from it by the sun, with which part the sun is nourished, and that the feculent and salt part is left behind. Aristotle admits, therefore, that evaporation is the cause of the saltness of the sea, except that this is not the only cause, but a fuliginous exhalation.

and colour also of the water, is according to the quality of the earth through which it flows [b].

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[b] Plato does not assert that Tartarus is the wholeness of water, as Aristotle says he does, who as usual confutes the apparent and not the real meaning of Plato's words. For Plato asserts this fabulously. It is not fit, therefore, to receive physically what is asserted mythologically. But Plato, says Olympiodorus, asserts these things, obscurely signifying something else. For having demonstrated in the Phædo through five arguments that the soul is immortal, he afterwards makes mention of the judicial places in Hades, viz. Tartarus and Pyriphlegethon, Cocytus and Acheron; so that Tartarus is not the wholeness of water, but of the places of judgement.

Olympiodorus adds, that what Plato says in the Phædo about Tartarus is to be considered ethically and physically. Ethically indeed, that Tartarus is a judicial place, from which all the judicial places are derived, viz. Cocytus, Acheron, and Pyriphlegethon, into which souls are hurled according to their different offences; those souls that are perpetually punished, on account of their offences being incurable, being hurled into Tartarus. Not that the soul is literally punished *for ever* in Tartarus; since divinity does not punish the soul from anger, but in order to apply a remedy to its maladies. But we must say that the soul is punished perpetually, calling perpetuity its life and its partial period. For in reality, souls that have committed the greatest offences, cannot be sufficiently purified in one period, but are in life perpetually, as in Tartarus, which period Plato calls *eternity*. It is requisite however not to be ignorant, that the *eternal* is one thing, and the *perpetual* another. For the eternal is the whole, as a whole now or instant, deprived of the past and future time, and wholly subsisting in the present abiding *now*. But the perpetual is that which indeed always subsists, but is surveyed in the three times, past, present, and future. Hence we call divinity eternal, in consequence of not having his being in time, but possessing it through the whole of time, past, present, and future, as a present now; for this is the nature of the eternal. But we do not call him perpetual, since he has not his being in time. If therefore, we call matter perpetual, it must be said that it is so, as being invested with form in time, and again receiving other forms, those that were prior being corrupted. Hence we may not only interpret Tartarus ethically, but also physically, by saying that Tartarus is matter, in consequence of the tumult and sedition of contrary natures which exist in it.

But when Plato in the Phædo says, that of the rivers which are derived from Tartarus, some having proceeded to a small extent again return into it, through the same place from whence they flowed, but that others proceeding to the greatest extent, no longer return to Tartarus through the same place whence they began to flow, but again make a period according to a place contrary in position to that from which they proceeded,—this considered *ethically* signifies that souls whose offences are difficult to be cured, or which are incurable, do not even for a little recede from generation, i. e. from Tartarus, which generation * is given to them as a punishment, in

order

* The reader must remember that by *generation* the whole of a visible nature is signified, as opposed to an incorporeal and invisible nature.

If this however were the case, it would happen, that rivers would not always flow to the same place. For since they flow into the middle from which also they originally flowed, they will no more flow from beneath than from above, but they will flow to whatever part fluctuating Tartarus tends; though if this happened, that which they say would come to pass, viz. that rivers would flow upward, which is impossible. Farther still, whence will the water originate which is generated, and which again flows upward? For it is necessary to exempt the whole of this, if the equal is always to be preserved; since as much as flows externally, will again flow to the principle. All rivers, however, which do not flow into others, are seen to end in the sea; but no one is seen to end in the earth; for though they disappear, yet they again emerge. But those rivers become great which flow to a great extent through a cavity; for they receive the streams of many rivers the courses of which they intercept in place and length. Hence the Ister and the Nile, are the greatest of the rivers which enter into the sea. And about the fountains of rivers different persons assign different causes of each, because many run into the same river. It is however evident that all these things cannot happen, especially since the sea also would have its ori-

order that they may be purified. But even though they appear to recede from it, through the dissolution of the body, yet they again return into generation, in another body. And those offending souls are easily cured, who are not very much attached to Tartarus, i. e. to generation. Hence after proceeding from, they do not immediately hasten to it, but for certain long periods of time remain without generation. According to a certain period however they again come into generation for the sake of being purified from their former offences. And such is the *ethical* explanation; but the *physical* is as follows: The corruption of a natural thing is produced, either from the imbecility inherent in that which is corrupted, in the same manner as the flame of a lamp; for this being enfeebled from the failure of nutriment is extinguished; or it is produced from the dominion of a contrary nature. Here, therefore, through the rivers which immediately again return to Tartarus, the corruption of a natural thing from itself is signified; but through the rivers which proceed in a contrary direction into Tartarus, the corruption from contraries is signified.

Lastly, when Plato says that the taste and colour of the water is according to the quality of the earth through which it flows, this signifies, that souls in which reason does not preside as a charioteer, are changed according to the subject temperament of the body. For when reason has dominion, the soul does not yield to the temperament of the body.

gin from thence. That the place therefore in which the sea is contained is the place of water, and not of the sea alone, and from what cause potable water is immanifest except when it flows, but another part of water is permanent; and why the sea is rather the end than the beginning of water, just as in [animated] bodies, excrement is the end of all nutriment, and especially of that which is moist, so much has been said by us."

CHAPTER XII.

The next thing that particularly demands our attention in the philosophy of Aristotle is his admirable doctrine concerning the Soul. But as the treatise in which this doctrine is contained is remarkably obscure, I shall incorporate in this chapter the substance of the Introduction to it, which accompanies my translation of that treatise.

In order therefore to understand the dogmas of Aristotle respecting the soul, it is necessary to speak in the first place of the powers of the soul, and show in how many ways they are divided, and what appellation each of them is allotted. In the next place it is requisite to enumerate the opinions of the ancients respecting these powers; and, in the third place, to unfold from division, the true opinion concerning them. In the first place then, psychical powers, (or powers belonging to the soul) receive a twofold division. For some of them are rational, but others irrational. And each of these powers is again divided in a two-fold respect. For of the rational powers, some are vital and orectic, (or pertaining to appetites) but others are gnostic. In a similar manner, also, the irrational powers are divided. Again, the rational and gnostic powers of the soul receive a triple division. For one of them is opinion, another is dianoia, and another is intellect. Opinion, therefore,

fore, is conversant with the universal which is in sensibles; since it has a knowledge of this. For it knows that *every* man is a biped, and that *all* colour is the object of sight alone. And, farther still, it knows the conclusions of the dianoëtic energy, but has no knowledge of the causes of those conclusions. For it knows *that* the rational soul is immortal, but it does not know *why* it is immortal, because this is the province of dianoia. But it is the province of opinion to know only *that* it is immortal. Hence opinion is that power which knows the universal in sensibles, and the conclusions of the dianoëtic energy, whence also opinion is well defined in the Sophista of Plato, to be the termination of dianoia. For the dianoëtic power syllogizing that the rational soul is immortal, opinion receiving this conclusion, only knows *that* the soul is immortal. But dianoia is that power which completes, as it were, a certain path, by passing from propositions to conclusions, from which, also, it derives its appellation. Thus, for instance, dianoia investigates whence it is that the rational soul is immortal. Afterwards, beginning from things more manifest, it passes on to the object of investigation, and says that soul is self-motive. That which is self-moved, is always moved: But this is immortal: Soul, therefore, is immortal. And this is the employment of dianoia. Hence it is the discursive, or evolved energy of reason, and when unperverted, is that power of the soul which reasons scientifically, deriving the principles of its reasoning from intellect. But the employment of intellect, properly so called, is to apply itself to things by simple projections, and in a way superior to demonstration. For as sense by its projecting energy, when it meets with something white, or some particular figure, has a knowledge of it superior to demonstration; since it is not in want of syllogism, in order to perceive that this thing is white, but it knows *that* it is by simple projection; thus, also, intellect knows intelligibles by a simple application of its gnostic power, in a manner superior to demonstration. The energy of intellect, however, is alone present with those who have arrived at the summit of purification and science, and who, through the carthartic virtues, are accustomed to energize without imagination and sense[6]. For intellect is, as it were, the most perfect habit of the soul; whence, also, Plotinus, speaking of this, says, "He who energizes according to it will know what I say," because it is not possible to explain such an energy by words. But of these powers, intellect has the first order, and opinion the last, and dianoia ranks in the middle, the energy of which is appropriate to our soul, since it also possesses a middle order in the universe. Through this power, likewise I mean the dianoëtic power, our soul is elevated to the contemplation of intelligibles, which is the perfection of the soul. For, since our soul is nourished with, and allied to sensibles, it is impossible, in consequence of her association with the senses, that she can immediately elevate herself to the contemplation of intelligible and immaterial forms; but at first she thinks that these also are bodies, and have magnitude, and other sensible properties. Thus, also, Plato in the Phædo says, that this is the extremity of all evils, that if, at any time, we are at leisure from the attendance of the body, and wish to apply ourselves to the contemplation of divine natures, then, invading us on all sides in our investigations, it causes agitations and tumults, and so vehemently impels us, that we are not able, through its presence, to perceive the truth. For the phantasy intervening, induces us to think that a divine nature is corporeal, and has magnitude and figure, and does not suffer us to form conceptions of divinity, incorporeally, and unattended with figure. On this account it is necessary that the soul, when proceeding to her perfection, should first energize according to the dianoëtic power, from its being conversant with objects that have a middle situation between intelligibles and sensibles; for such are dianoëtic objects; such are our soul, and the theory pertaining to it; and also the mathematics, since mathematical forms have an essential subsistence in the soul. For, by being accustomed to energize immaterially about these, we shall be able gradually to ascend to the contemplation of those intelligible forms which have their subsistence in deity, and which are the paradigms, or models, of every thing that has a perpetual subsistence according to nature. Hence Plotinus says, that youth should be led through the mathematics, in order that they may become accustomed to an incorporeal nature[7].

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[6] See this explained in the notes on the third book of Aristotle's treatise On the Soul.

It is owing, likewise, to the illuminations of a separate intellect infused into the soul, that all men have common conceptions, which are certain vestiges, and resemblances of intellect; and the knowledge of these conceptions is indemonstrable, or, rather, is superior to demonstration. And these are such, as that things equal to the same thing are equal to each other; that if equal are taken from equal things, the remainders are equal; that in every thing there is either affirmation or negation; that all things desire good; and the like. For to a belief of these, we require no proof, but we know them immediately, and our knowledge of them is better than that of demonstration. These common conceptions, therefore, which all men possess, are evidently resemblances of intellect. Hence, intellect is said to be the principle of science, by which we obtain a knowledge of intelligibles. And Aristotle, in his Posterior Analytics, says concerning this, against those who are of opinion that there is no such thing as science, that we not only say, there is science, but also, the principle of science by which we have a knowledge of terms; by terms, either meaning common conceptions, or intelligibles, which are the boundaries of beings. For a term, as the geometrician says, is that which is the end of something; and intelligibles are the highest extremities of beings.

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[7] The following beautiful account of the utility of the mathematical science, is extracted from the Commentaries of Proclus on Euclid, p. 6. "Timæus calls the knowledge of the mathematical disciplines, the path of erudition, because it has the same relation to the science of wholes, and the first philosophy, which erudition has to virtue. For the latter prepares the soul, by the possession of worthy manners, to a perfect life; but the former enables our reasoning power, and the eye of the soul, to ascend from the obscurity of sensible information. Hence Socrates, in the Republic, rightly observes, 'that the eye of the soul, which is blinded and buried by other studies, is alone adapted to be resuscitated and excited by the mathematical disciplines; that by these it is again elevated to the contemplation of real beings, is transferred from images to realities, and from darkness to intellectual light, and, in short, is extended from a cavern, and its detaining bonds, and the fetters of matter, to an incorporeal and impartible essence.' For the beauty and order of the mathematical reasons, and the firmness and stability of the contemplation they afford, conjoin us with intelligibles themselves, and perfectly establish us in their essences, which are always adorned with divine beauty, perpetually remain the same, and preserve a mutual order, without end. But Socrates, in the Phædrus, delivers to us three characters who are elevated from a sensible to an intellectual life, and who, according to him, give completion to the primary life of the soul, viz. the *philosopher*, the *lover*, and the *musician*. The principle, however, and path of elevation to the lover, is from apparent beauty, by employing, as steps in the ascent, the middle forms of beautiful objects. But to the musician, who is allotted the third rank, the transition is from sensible to unapparent harmony, and the reasons it contains. And to the one sight, but to the other hearing, is the instrument of reminiscence. To him, however, who is naturally a philosopher, whence, and by what means is the reminiscence of intellectual knowledge effected, and the excitation to real being and truth? For this character, also, on account of its imperfection, requires a proper principle. It must be excited, therefore, from itself; and he who is naturally such, is astonished by the contemplation of real being."

And again, p. 9, he observes, "that Plato clearly evinces that the mathematical sciences have a power of purifying, and elevating the soul, removing, like the Homeric Minerva, the darkness of sense from the intellectual light of the dianoëtic power, which is better worth saving than ten thousand eyes; so that these disciplines not only partake of Mercurial gifts, but also of those of Minerva."

But of the irrational powers of the soul, some are gnostic, and others are vital and orectic. And the gnostic, indeed, are phantasy and sense. These, however, differ from each other, because sense is extended to externals, but the phantasy possesses knowledge inwardly. For sense only knows that which is present, and which it apprehends externally; but the phantasy receiving the types, or impressions of sensibles, from sense, fashions these in herself. Whence also Aristotle calls it passive intellect; intellect, indeed, as having the object of knowledge inward, and applying to this object by simple projections, like intellect, and without proof; but passive, because its knowledge is attended with impressions, and is not unfigured. It is also called *phantasy*, as being φανστασια τις, or *a certain permanency of appearances;* for it establishes in itself those things which are externally apparent. Each of these powers, however, is extended about a partial object; for it knows *this particular* white thing, and not *every* thing white. But they differ, because the one knows that which is external, and the other that which is internal. And the phantasy, indeed, receives the impressions of the five senses; but each of the senses alone knows its proper sensible object.

Again, of the orectic and vital powers, one is anger, but the other desire. For, since Providence sent us hither, in order that we might adorn a terrestrial nature, he committed to us this allotment, which he was willing we should preserve. And that we might accomplish this, since there are many things which are detrimental to this allotment, and our mortal nature is flowing and obnoxious to corruption, it gave us anger and desire, that by the former we might repel whatever is detrimental, and by the latter might re-weave what we lose by continual effluxion.

The practical rational powers, however, are will, and pre-election, or deliberate choice. And the will, indeed, is alone directed to good; but pre-election is of an ambiguous nature. And the will is of the rational soul, as itself subsisting by itself; but pre-election pertains to the rational soul, so far as it is complicated with irrationality. For when the soul is beyond generation[8], she alone energizes according to will; since she is then in good alone. But when she subsists in generation, since irrational powers are then connected with her essence, she possesses, as the consequence of this complication, pre-election, because at one time she is conversant with irrationality, and at another time with reason, and chooses this thing *prior* to that.

Besides these powers, however, there are what are called the vegetative powers; and these are three, the nutritive, the augmentative, and the generative. But they are called vegetative, because these alone are seen in plants. For when plants are irrigated and manured, they are nourished and increased, and generate that which is similar to themselves. For the vine is from a vine, and the olive from an olive. In short, we are men and animals, and animated natures. And so far as we are men, we have the rational powers already enumerated; but so far as we are animals, we have the irrational powers; and so far as we are animated, we have the vegetative powers. For we also say that plants are animated; since to be nourished, to be increased, and to generate beings similar to themselves, pertain to animated natures.

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[8] By the term generation, the whole of a visible nature is to be understood.

Plants, therefore, are also said to live and die. But life and death are produced by the presence and absence of soul. Such beings, therefore, as have the more excellent lives, have also, from necessity, those that are subordinate; but the converse is not true. For it is not possible that the rational powers can be possessed without the previous possession of those that are subordinate. In the senses, also, it is not possible for an animal to participate of the more excellent sense, which does not participate of a subordinate sense. Such animals, therefore, as participate of sight, participate also of hearing, and the other senses; and such as participate of hearing, these, likewise, have the smell, the taste, and the touch; but they do not entirely participate of the sight, as is evident in the mole. Indeed, there are some animals which alone participate of the touch, as the sponge. Hence, it is not possible for an animal to participate of the more excellent without participating of the subordinate powers. This, however, is not because the superior are in want of the inferior powers to their subsistence, but, on the contrary, the body is not able to participate of the more excellent, unless it previously participates of the subordinate powers. Thus the body cannot participate of the irrational without a previous participation of the vegetative power; nor of the rational power, without a participation of both these. For, since it is necessary that no form should perish, lest the universe should be imperfect; for the world is a plenitude of forms; and it is impossible that sublunary natures should remain numerically the same, since they are generable and corruptible;—hence these, also, participate of perpetuity, as far as they are able, since all things desire eternity, or the first perpetuity, as their proper principle. And each individual participates of this according to its own measure. Hence, also, terrestrial natures, not being able to be numerically perpetual, each of them participates of perpetuity, by generating a being like itself. And this work of nature, viz. for every vital being to generate another like itself, is what nature proposes to herself as her principal scope. Since, therefore, we require generation, but the generative power subsists in a definite magnitude, on this account we require increase. Since, also, increase is produced through nutriment, we are in want of the nutritive power; and hence, both we, and irrational animals, participate of physical powers; so that when we energize according to these powers, we energize as plants; but when according to anger and desire, we energize as irrational animals; and we alone energize as men when we employ the reasoning power. Hence, also, Plotinus very divinely says, "that those who furiously energize according to the nutritive powers, are in danger of being changed into trees."

It is worth while, however, to consider what the difference is between desire[9], and those natural powers, the generative and nutritive. For we do not see that desire energizes about any thing else, than about nutriment and the generative powers, so that it would seem to follow that desire is the same with the vegetative powers. What, then, shall we say? That it is not the same. For desire, indeed, energizes in conjunction with sense; but the vegetative powers energize without sense. Hence irrational animals are excited to appetite by the view of females; so that desire is attended with a certain knowledge, but this is not the case with the vegetative energies. Indeed, we frequently emit the seed when asleep, no sense or imagination having preceded the emission, and we do this in consequence of energizing according to the vegetative powers. For, as when reason is enslaved by the irrational part, it employs every means to gratify luxurious appetite, and yet we do not on this account say, that reason is the same with the vegetative powers; thus also we say with respect to desire. The peculiarity, however, of the vegetative powers is simply to aspire after nutriment and coition, unattended with sensation; but the peculiarity of desire is to aspire after certain nutriment, a certain coition, and, in short, after that which produces delight. Is there, then, one and the same end of desire, and of the vegetative power? There is not. But of the latter, the end is simply nutriment, or coition, and of desire the end is pleasure. This, however, is the end of desire, in order that by this tendency we may preserve the condition we are allotted in the universe, and the succession of our race. But to reason, when it enslaves itself to desire, there is not a certain peculiar end of this energy, because such an energy is unnatural to it. And things which are unnatural, are not directed to a certain end. For reason in this case, like a slave, procures pleasure not as its own end, but as the end of desire. Have we, then, three souls, and are we governed by three souls? To this we reply, that as the soul, from its union with this body, appears, indeed, to form but one thing, yet in reality is not one thing; thus, also, by the conjunction of the irrational and vegetative powers, it produces, through contact, one certain continuity. For the irrational is proximately suspended from the rational part; but the vegetative from the irrational part. And through the sympathy arising from this contact, we say that there is one soul; and that the irrational part uses the subordinate or vegetative powers as instruments. Of these powers, however, I mean the irrational and the vegetative, some are more, and others less near to the rational soul. The irrational powers, indeed, are more near, because they are capable of being obedient to reason. On which account, by reproving desires, we render them more mild. Hence Homer represents Ulysses striking his breast, and thus addressing his heart:

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[9] It must be carefully observed by the reader, that *desire*, in conjunction with *anger*, form the two great orectic and vital powers of the soul; that these powers are irrational; and that consequently *desire*, as an irrational power, is not merely *a wish to enjoy any thing*, because, in this sense of the word, there are rational as well as irrational desires.

Poor suff'ring heart! he cry'd, support the pain
Of wounded honour, and thy rage restrain.

Hence, also, the precept, accustom yourself to subdue anger, pleasure, and pain, and the like. But the vegetative powers, as not being obedient to reason, are more remote from the rational soul. For it is not possible to order the nutritive power to nourish, or the augmentative to increase, or the generative to generate only to a certain extent. If, however, we render the generative power more moderate, it is evident that we do not simply repress this power itself, but desire; for the power remains nevertheless, though it does not energize. And such are the rational, irrational, and vegetative powers of the soul.

In short, with respect to the soul, some of the ancients say, that it is incorporeal, but others, that it is a body. And of those who say it is a body, some assert that it is a simple, but others that it is a composite body. And of those who assert that it is a composite, some say that it is composed from conjoined, but others from unconjoined bodies. But of those who assert that the soul is a simple body, some indeed say, that it is an etherial, i. e. a celestial body, as Heraclides Ponticus. But others say that it is fire, as Heraclitus, since, according to him, fire is the principle of things, and thus the soul is of a fiery nature, on account of the facility of its motion. Others, however, say, that the soul is aërial, as Anaximenes, and some of the Stoics. But others, that it is aqueous, as Thales, and Hippo, who was surnamed the Atheist. For, since they saw that seed is from a moist essence, on this account they thought that water is the principle of things. No one, however, has dared to call the soul earth, on account of the gravity and immobility of this element. These, therefore, are the philosophers who said that the soul is a simple body, since there are only these five simple bodies; and these also, alone, among those who said that the soul is a body, are able to assert that it is immortal. But of those who thought that it is a composite body, some assert that it consists of unconnected elements, as Democritus and Leucippus, and, in short, those who introduce atoms. For they said, that the principles of things are atoms, and a vacuum; and hence, that the soul is composed from spherical atoms, on account of the facility of its motion. But others said, that it consists of connected elements, as Critias, who was one of the thirty tyrants. For he said, that the soul is blood; since he asserts that the conceptions of men are the blood that surrounds the heart. Of those, however, who were of opinion that the soul is immortal, some say that it is separable from the body, but others that it is inseparable. And of those who say that it is inseparable, some assert that it is the ratio of the temperament; as, that if a double or a sesquialter quantity of fire, or fire in any other ratio, is mingled with water, it will produce soul. For that double or sesquialter ratio is the soul. But others assert that the temperament itself is the soul. Others again assert that it is *entelecheia*.

But *entelecheia* is the perfection and form of the subject. Ratio, however, differs from temperament. For ratio is surveyed in quantity, such as in the sesquialter, or in the double, and the like. And, in short, the definite habitude, according to quantity, of this thing to that, is the ratio of the things mingled. But temperament is the quality which arises from the mixture of qualities. Thus, for instance, a certain temperament, i. e. the tepid, is produced from the hot and the cold, or a brown colour from the white and the black. But entelecheia, as we have said, is the perfection of the subject, i. e. it is the form which accedes to matter from a certain composition of the elements; as to clay the form of a shell accedes. But of those who assert that the soul is separable, some say that every soul is separable from the body, the rational, the irrational, and the vegetative; and this was the opinion of Numenius, who was deceived by what Plato says in the Phædrus, " that *every* soul is immortal," though he is there evidently speaking about the human soul. Others again assert, that every soul is inseparable from the body, and is on this account mortal, among whom is Alexander Aphrodisiensis, who also endeavours to draw Aristotle to his opinion. But others assert that the rational soul is separable, but that the irrational and vegetative are inseparable. Of these, however, some assert, that both the irrational and vegetative soul are inseparable from this gross body; but others, that the vegetative soul alone is inseparable from it; and that the irrational soul is indeed separable from this body, yet is inseparable from a certain pneumatic body, which is the true opinion, and which was also adopted by Plato and Aristotle.

It is not, however, proper to acquiesce in the assertions of the ancients, unaccompanied with proofs of their truth, but we should procure demonstrations of every thing; for these dogmas extend to the whole of our life. To which we may add, as we have before observed, that nothing can be more appropriate to us than the knowledge of ourselves. We shall demonstrate, therefore, that every soul is incorporeal, and that the rational soul alone is separable from all body, and on this account is immortal. That the irrational soul, indeed, is separable from this gross body, but is inseparable from the pneumatic vehicle. And, farther still, that after its egress from this gross body, it remains for a certain time; and that the vegetative soul has its being in this body, and perishes together with it.

That all the above-mentioned opinions, therefore, which assert that the soul is a body, whether simple or composite, are false, that we may give a confutation of them all in common, is evident, from the following arguments: Every body is, according to its own nature, dissipable, and is divisible to infinity. Hence it requires something to connect it. With respect to this something, therefore, by which it is connected, since it is either soul, or some other power, whether is it a body, or incorporeal? If, indeed, it is a body, there will again be wanting that by which it is connected. Again, therefore, we may interrogate concerning this connecting something, whether it is a body, or incorporeal; and this will be the case to infinity. Hence it is necessary that the power which is connective of body should be incorporeal. But soul is connective of animated bodies. Every soul, therefore, is incorporeal. In the treatise On the Soul, however, Aristotle, after having in many ways confuted these opinions, adds, "Why do I speak of the other powers, since the last of the gnostic powers of the soul, sense, is demonstrated to be incorporeal by linear necessities." If, therefore, the last power is incorporeal, much more are the superior powers. How, therefore, does he demonstrate this? No body, says he, is capable of receiving contraries at the same time, according to the same part. For the whole finger cannot, at one and the same time, partake of black and white; nor can it be, at the same time, according to the same part, refrigerated and heated. But sense at once apprehends contraries in the same time. For in reading, it apprehends, at once, black and white. Hence it knows that this is first, and that second, by distinguishing the black letters from the white paper. How, therefore, does the sight apprehend contraries in the same time? Shall we say that it apprehends them according to the same part; or that, by one part, it apprehends the black, and by another part the white? If, therefore, it apprehends them according to the same part, it apprehends them impartibly, and is incorporeal.

poreal. But if by another and another part, it is just as if I perceived one thing, but you another. Just as if you should say, that which I saw is different from that which you saw. For it is necessary that what judges should be one and the same, and that it should also apprehend the objects that are judged according to one and the same. But it is impossible that a body can apply itself, in the same time, according to the same part, to contraries, or, in short, to different things. Sense, however, in the same time applies itself to white and to black. Hence it applies itself impartibly; and on this account is incorporeal. For, if it apprehended the black and white according to another and another part, it would not be able to distinguish the white from the black. For no one distinguishes that which is seen by himself from that which is seen by another.

That the phantasy, also, is incorporeal and impartible, is evident from the following arguments. For whence comes it to pass that the supervening types, or impressions, do not obliterate the pre-existent types? which, if it were a body, would be the case, as is evident in wax; in which the supervening obliterate the pre-subsisting impressions. The vegetative soul, also, which is subordinate to sense, and physical reasons themselves, are clearly demonstrated to be impartible, and on this account incorporeal. For in each part of the seed there are the same vegetative reasons, or producing principles, having an impartible subsistence, as there are in the whole seed, viz. the nutritive, the augmentative, and the plastic principles. For as the whole emitted seed, if it is contained in the matrix, produces a perfect animal, thus, also, if not the whole, but a part is received by the matrix, it will nevertheless generate a perfect animal. If, therefore, the vegetative reasons of the animal were a body, the principles of the head, of the feet, and of all the parts, would not be able to exist at the same time in the same part. Now, however, they are in the same part; and, therefore, they are incorporeal. For that which is impartible is also incorporeal.

As, therefore, the nutritive, augmentative, and generative powers are contained in the whole tree, thus also they are contained in the branch and the kernel.

Some, however, may perhaps doubt whence monsters originate?

Whether it is not because the seed is deficient, or abounds? And why, again, if corn is mutilated, the remaining part no longer germinates? Why also the bark of a tree does not produce a leaf, or any thing of this kind, though these also are parts of the tree? With respect to monsters, therefore, it must be observed, that matter is the cause of these; since to the formation of a perfect animal, it is necessary that there should be an aptitude of matter, both according to quantity, and according to quality. But the matter of animals is the menses. If, therefore, this matter is superabundant, or deficient, or receives any preternatural quality, then it is the cause of monsters. And, in short, these powers are incorporeal, but have their being in a subject body, and require to their existence a subject commensurate both in quality and quantity. But if, in short, the powers in the whole tree, and in the parts, are found to be deficient, it is from no other cause, than that they are of themselves impartible. For if they were bodies, they would not exist wholly in the amputated branch, and the tree would be mutilated. If, however, some one should observe that it may be said, there are bodies of similar parts which pervade through the universe, and that in bodies of similar parts there is the same form in the part as in the whole, as is evident in flesh, since a part of flesh is flesh;—to this we reply, that bodies of similar parts could not wholly proceed through the whole of the subject matter; for it is impossible that body should pervade through body. If, therefore, the subordinate psychical powers are incorporeal, much more is the rational power, which is much more excellent. For that the rational power is incorporeal, is demonstrated through common arguments; but we shall also speak peculiarly of it, as follows:—

No body itself knows itself, nor is converted to itself; for neither the hand, nor any other part of the body, knows itself. But neither do the irrational powers, though they are incorporeal, know themselves; for neither does the sight, nor the hearing, nor, in short, sense, know itself, nor investigate in what its nature consists: but it is reason which makes them the subject of inquiry. The rational soul, however, itself knows itself. It is itself, therefore, which investigates, and itself which is investigated: it is itself which discovers, and itself which is discovered; itself which knows, and itself which is known. It is clearly, therefore, demonstrated to be incorporeal. The powers, also, which are in the subject body, arrive at their acme together with the body, and decay together with it; and such are sense, anger, and desire. On the contrary, the rational soul rises in vigour when the body wastes away. It is not, therefore, in the body as in a subject. Again, nothing endeavours to destroy the subject of itself; for all things aspire after being. But the rational soul despises the body, tames it by virtuous labours, and often entirely deserts it. The rational soul, therefore, has not its being in the body as in a subject. Thus, then, it is demonstrated, that no psychical power is a body.

In addition to these things, also, it is requisite to demonstrate that the rational soul has an essence exempt from all body; but the other souls have their existence in the body. And the irrational soul, indeed, has its existence in the pneumatic vehicle, but the vegetative, in this gross body. In order, therefore, that we may demonstrate this, it is necessary to pre-assume, that Aristotle delivers to us a rule in the preface of this treatise, which is adopted in common by all philosophers, both by those who conceive the soul to be mortal, and by those who believe it to be immortal. The rule is this; It is necessary, says he, to form a judgment of essences from their energies; since every essence has a co-ordinate energy. Every essence, therefore, says he, which has no one energy separate from body, is not itself separate. For if, having a separate essence, it has no energy separate from body, when it is separated from body it will have no object for its energy; so that it will be in vain. But neither God nor nature make any thing in vain. Neither, therefore, is it possible that a separate essence should have no energy separate from body.

Again, another rule is as follows: Every essence which has an energy separate from body, is also itself necessarily separate from body. For if it were not separate, it would happen that the thing caused would be more excellent than the cause; and that what is subordinate would be better than what is superior, which is absurd. For it is always necessary that the cause should be better than the thing caused; and that what is naturally prior should be superior to that which is posterior. How, therefore, does this take place? We know that all energy is derived from power, and all power is derived from essence. Energy, therefore, has the third order from essence. Hence, if essence is inseparable from body, but energy is separate, and that which is separate is better than that which is inseparable, energy is better than essence; viz. the effect is better than the cause, and that which is naturally posterior than that which is naturally prior, which is absurd. It is impossible, therefore, that an energy which is separate from body should not proceed from an essence which is itself separate. These, then, are Aristotelian rules, the latter of which is useful to the discussion of the rational part, but the former to the discussion of the other parts, of the soul. At present, therefore, we shall speak of the rational part. If, then, no essence which is inseparable from body has a separate energy, but we can demonstrate that the rational soul has an energy separate from body, there is every necessity that it also should be separate. When, therefore, the soul, by the dialectic method of Plato[1], ascends through well-ordered gradations to being itself, and at length arrives at the ineffable principle of things, it is evident that it has such an energy as this entirely separate from body. And this is also the case when it investigates itself. For in these energies it does not employ the co-operation of the body, nor does it itself energize about the body. So that such an energy is entirely separate from the body, and even from the phantasy itself. For though, as we shall observe from Simplicius, those energies which are conversant with intelligibles according to an external projection, (as when the soul by a reasoning process endeavours to prove the existence of these luminous beings,) are not without the phantasy, so far as it follows, yet does not co-operate with them, just as a shadow follows a body in the light;—though so far as this is the case, these energies are inseparable from the phantasy, yet the stable energy of the soul, and which is contracted into the essential, is perfectly separate, and is not at all moved in conjunction with the motion of any corporeal-formed appetite, or knowledge. But if the energy is separate, the essence also of the rational soul will be necessarily separate. And if the essence is separate, there is every necessity that it should also be perpetual. For this all men acknowledge in common, that every essence which is separate from bodies is also perpetual. For, consider, if the rational essence being separate, is not perpetual, but generable and corruptible, before it was generated, it was either capable or not capable of being generated. And if, indeed, it was not capable, it would not be generated; for that which is impossible cannot be effected. But if it was capable, it was entirely material. For the capability of some time or other being or not being this particular thing, is the province of matter. If, however, the natures which are separate from matter are immaterial, they will not pass from a subsistence in capacity to a subsistence in energy, but will always be in energy.

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[1] See this master science copiously explained in the Introduction to and notes on my translation of the Parmenides of Plato.

Again, whatever is corrupted, is corrupted according to two modes; either by the analysis of bodies into their elements, or by the extinction of the form of incorporeal natures, through the incongruity of the subject in which it has its being, in the same manner as the harmony is destroyed when the chords of a musical instrument are relaxed. According to neither of these modes, therefore, can the rational soul be corrupted. Not after the manner of corporeal natures; for it is incorporeal. Nor can it be corrupted after the manner of things which are incorporeal, indeed, but have their being in a subject body. For it has been demonstrated that it is separate from body; so that if it is demonstrated to be separate from body, it is at the same time demonstrated that it is perpetual. And thus much concerning the rational soul.

In the next place, let us speak concerning the irrational and vegetative souls; for that these are inseparable from the body, is evident from the above-mentioned rule. For if we can demonstrate that they have no energy separate from body, there is every necessity that they should be themselves inseparable from body. All the energies, therefore, of these souls are in and about the body. For the nutritive, the augmentative, and the generative powers, are in body, energize through, and are conversant with the body. Farther still, this is also the case with anger and desire. For the former moves the blood which is about the heart, and the latter thus disposes the liver, i. e. excites it as the instrument of desire. Hence, they are in body, and energize through the body, and are also conversant with the body. For desire is the appetite either of food, or colours, or, in short, corporeal things; and anger is wholly intent on avenging incidental molestations. Hence, if the energies of these are not without the body, this also must necessarily be true of their essences. For if separated, about what would they energize? What would they nourish, or increase, or generate? What incidental molestation would anger avenge; or what pleasurable objects would excite the appetite of desire? If separate, therefore, they would be in vain. But if it is impossible that any being should exist in vain, the essence from which such energies proceed is inseparable from body. The vegetative soul, however, is inseparable from this gross body, and is corrupted together with it; and its powers after the departure of the rational soul remain for a short time in this body. Since, whence does the putrid and easily dissoluble increase arise? For in dead bodies the nails and hairs are increased. But if there is evidently a vestigie of the augmentative power after death in the body, it is also necessary that there should be a vestigie of the nutritive power; since nutriment is for the sake of increase. Hence, therefore, it is evident that these powers have their existence in this body; and if these powers, it is also necessary that this should be the case with the generative power. For it is of the same co-ordination, because where the former are, there the generative power is necessarily seen to be. The irrational soul, however, no longer has an existence in the dead body. For after the departure of the soul from this gross body, the vehicle and subject containing the pneumatic body remain, which also is itself composed from the four elements, but from the predominance of air in it is said to be aërial; just as this gross body, from the predominance of earth in it, is said to be terrestrial. Whence, however, is it evident that the irrational life has its being in this vehicle? Or rather, whence, in short, is it manifest that there is a pneumatic body? For it is proper, in the first place, to investigate whether there is such a body, and afterwards to show that the irrational life subsists in this. It is acknowledged, then, or rather is demonstrated, that our soul, after its departure from this body, passes into an invisible state, called Hades, and there suffers the punishment of its evil deeds in the present life. For Providence not only pays attention to our being, but also to our well being, Hence, the soul is not neglected when it falls into a preternatural state of existence, but participates of a providential attention adapted to its condition. Since, also, its errors arise from the sweetness attending the gratification of desire, its purification must from necessity be effected through pain. For in the present life, also, contraries are the remedies of contraries. On this account the soul, which is purified in the places of judgment under the earth, suffers pain through punishment. If, however, the soul is incorporeal, it is impossible that it should suffer. How, therefore, is it punished? We reply, it is perfectly necessary for this purpose, that a certain body should be suspended from it, which body, when it is immoderately dissolved or congealed by excessive heat or cold, pains the soul from sympathy; just as in the present life, when this outward body suffers, the soul is pained, in consequence of the physical bond, and the sympathy arising from it; since that which is itself by itself incorporeal cannot suffer from any thing. What kind of body, therefore, is this which is suspended from the soul? It evidently is not this gross outward body; for this is resolved into the elements from which it is composed. But it is that which we call the pneumatic body [2]. Anger and desire, therefore, are in this body, as in a subject, and are inseparable from it. For if the soul, immediately on its departure from the present life, was liberated from these passions, it would be entirely purified from generation. But being liberated from generation and the passions, it would dwell on high, and would not be confined in the places of judgment under the earth. For it is impossible that the soul should be liberated from generation which has not purified herself. For since she is self-motive, and voluntary falls from good, it is necessary, in order that she may be led back to her pristine perfection, that she should herself purify herself. Those subterranean places of judgment, however, are not able to elevate her, but only convert her to herself. Hence, when

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[2] "The spirit," says Proclus, (in Tim. p. 311,) "comprehends the summits of the irrational life, and these, together with the vehicle, (i. e. the etherial vehicle of the soul,) have a perpetual subsistence, as being produced by the demiurgus himself. But these summits becoming extended and divided, produce the life which the junior gods are said by Plato to weave, and which is mortal,

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mortal, because it is necessary that the soul should divest herself of this distributed life when, through purification, she returns to her pristine state of felicity. This distributed life, however, has a more extended existence than the life of this gross body, and on this account the soul has a life of this kind, when making choice of lives in Hades. For, by verging to a subordinate condition of being, she receives this mortal life from the junior gods. If this be the case, the demiurgus gives subsistence to the summits of the irrational life, but does not produce the irrational life itself; since, giving subsistence to dæmons, he also produces the irrational life which is in them, yet not that which the junior gods weave in us; for this latter is alone adapted to souls falling into generation. The gods, therefore, (that is, the mundane gods,) also illuminate their vehicles with rational-formed lives, they themselves having intellectual souls. But those dæmons who are peculiarly distinguished by reason, use irrational powers, but keep them in subjection to reason. Much more, therefore, have our souls a life in the ethereal vehicle which is irrational, when compared with that of dæmons, but is more copious, by assuming another irrational life, which is a degeneration of the life in the spirit, which degeneration is woven by the junior gods. The whole, therefore, of that life is immortal, which the soul possesses in imitation of wholes; but the additional life pertains to the secondary and mortal life. If, therefore, in the ethereal vehicle there is one impassive sense, this generates in the pneumatic vehicle one passive sense, and this one passive sense generates in the outward gross body many and passive senses. The orectic power, also, in the ethereal vehicle produces many orectic powers in the pneumatic vehicle, which have something separable from the outward body, and are capable of being disciplined: and these produce in the outward body, ultimate and material powers."

From this remarkable passage it follows, that the first subsistence of the spirit is with the ethereal vehicle of the soul; that it contains in itself the summits of the irrational life; and that the irrational life which is in the pneumatic vehicle is a degeneration from the life in the ethereal vehicle, and is also mortal. The reader will find much interesting information on this subject, by consulting my translation of a part of Synesius On Dreams, in the History of the Restoration of the Platonic Theology, vol. ii. p. 269, of my translation of Proclus on Euclid.

when she repents of her errors, she becomes purified by her own proper impulse, and voluntarily divests herself of that sympathy by which she was voluntarily bound[3]. Hence, after the subterranean places of judgment,

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[3] "The extremity of all evils," says Synesius, (see p. 272 of my History above mentioned,) "consists in not perceiving the present evil; for this belongs to such as have no desire to emerge, but like those whose skin is hardened by disease, for as they are no longer tormented with pain, so neither are they anxious to be cured. Hence penitence possesses a peculiar power of re-elevating the soul. *For he who endures his present state with sorrow and remorse, will meditate his flight*; and *the will is the greatest part of purgation.* Indeed, through the means of this, both our deeds and words extend their hands to assist us in our ascent; but this being taken away, the soul is deprived of every purifying machine, because destitute of assent, which is the greatest pledge of reconciliation. Hence, both here and elsewhere punishments bring with them the greatest utility to the order of things, while they oppose molestation to delight, and banish stupid pleasure from the soul. Misfortunes, too, which are said to happen contrary to our deserts, are of the greatest advantage in extirpating the passions by which we are captivated with externals; and thus the doctrine of a Providence is confirmed to the intelligent, from the very circumstances which produce diffidence in the ignorant."

To the above most excellent citation, the following also may be added as no less admirable, from the MS. Commentary of Olympiodorus on the Georgias of Plato. See my translation of that Dialogue, p. 455. The passage in Plato, on which Olympiodorus comments, is as follows. "Radamanthus, likewise, sees that such a soul, (i. e. a soul in which nothing is right, in consequence of its having been educated without truth,) through power, luxury, and intemperate conduct, is full of inelegance and baseness, On seeing, however, a soul in this condition, he *directly* sends it into custody with disgrace; whither, when arrived, it will suffer the punishment which it deserves. But it is proper that every one who is punished, if he is rightly punished, by another, should either become better, and derive advantage from his punishment, or become an example to others, that others, perceiving his sufferings, may be terrified and made better. Those, however, are benefitted, and suffer punishment both from gods and men, who have been guilty of curable offences: but at the same time the advantage which they derive both here and in Hades takes place through torments and pain; for they cannot by any other means be liberated from injustice. But those who have acted unjustly in the extreme, and have through such crimes become incurable, serve as examples to others. And these no longer derive any advantage as being incurable; but others are benefitted on perceiving them suffering through *the whole of time*, the greatest, most bitter, and most horrid punishments for their guilt, being, indeed, suspended in the prison of Hades as examples, spectacles, and warnings to the unjust men that come thither."

On this very important passage, Olympiodorus thus beautifully comments. "It is necessary to know that souls which have moderately sinned, are punished but for a short time, and afterwards being purified, ascend. But when I say they ascend, I do not mean locally, but vitally: for Plotinus says, that the soul is elevated, not with feet, but by life. But souls that have committed ment, the soul becomes again a resident on the earth, till, being purified by herself, and liberated from generation, she becomes adapted to ascend.

mitted the greatest crimes are *directly* sent to Tartarus; Plato using the word *ευθυς*, *directly*, instead of *swiftly;* a right line being the shortest of lines which have the same extremities. It is here, however, worth while to doubt, why Plato says they are always judged, and are never purified. What, then, is there never any cessation of their punishment? If, however, the soul is always punished, and never enjoys good, she is always in vice. But punishment regards some good. It is not proper, therefore, that the soul should always continue in a state contrary to nature. If, therefore, punishment does not in any respect benefit us, nor bring us to a better condition, it is inflicted in vain. Neither God, however, nor nature, does any thing in vain. What, then, are we to understand by the term *ever*. We reply as follows: "There are seven spheres, that of the moon, that of the sun, and those of the other planets; but the inerratic is the eighth sphere. The lunar sphere, therefore, makes a complete revolution more swiftly; for it is accomplished in thirty days. That of the sun is more slow; for it is accomplished in a year. That of Jupiter is still slower; for it is effected in twelve years. And much more that of Saturn; for it is completed in thirty years. The stars, therefore, are not conjoined with each other in their revolutions, except rarely. Thus, for instance, the sphere of Saturn and the sphere of Jupiter are conjoined with each other in their revolutions in sixty years. For if the sphere of Jupiter comes from the same to the same in twelve years, but that of Saturn in thirty years, it is evident that when Jupiter has made five, Saturn will have made two revolutions; for twice thirty is sixty, and so, likewise, is twelve times five; so that their revolutions will be conjoined in sixty years. Souls, therefore, are punished for such like periods. But the seven planetary spheres conjoin their revolutions with the inerratic sphere, through many myriads of years; and this is the period which Plato calls *τον αει χρονον*, *for ever*. Souls, therefore, that have been patricides or matricides, and universally souls of this description, are punished *for ever*, i. e. during this period. Hence the soul converts herself to herself gradually, and again receives an organ on the earth adapted to her desert. It is necessary, therefore, to know that a pneumatic vehicle is suspended from the soul, and that this is punished by becoming either very much heated or refrigerated. It may also be said, that certain dreadful objects present themselves to the view, such as the tragedian speaks of, viz. virgins with a bloody aspect, and the like.

"It is likewise necessary to know, that punishment makes the soul more sane, and renders her more adapted to be purified. We must not, therefore, think that punishments are purification itself. For, if the soul should be punished without being converted to herself, she would not be purified. When, therefore, she becomes sober and converted to herself, as being self-motive, then she is purified; since a physician also purifies a depraved body, but he does not render it strong by his purification. The diseased person, however, recovers his health afterwards, by taking care of himself, and not acting in a disorderly and irregular manner by the assumption of improper food. And again, as he who comes from health to disease forgets what he did when he was well, but as he recovers his health again remembers; so the soul coming into the present life forgets the punishments which she formerly endured, and thus acts erroneously. For if she was cend. Then, therefore, when she ascends, she lays aside anger and desire, together with this pneumatic vehicle. After this pneumatic vehicle, however, there is another body perpetually suspended from the soul, which is celestial, and on this account perpetual, and is luciform, or starry. For the soul ranking among mundane natures, it is perfectly necessary, since she is a part of the world, that she should have a certain allotment to maintain. And if she is always self-moveable, and it is necessary that she should always energize, it is necessary that she should perpetually have a certain dependent body, which she may

always conscious of this, she would not sin. This forgetfulness, however, happens to her for a good purpose; for if she remembered, and did not err through fear, she would preserve through fear her proper good, and thus would no longer be well conditioned, or act like a self-motive nature. She becomes oblivious, therefore, that she may explore good as being self-motive; since we also love servants, and consider them as of more worth when they serve us voluntarily, and not through fear.

"Souls, therefore, are punished here, but they appear to be especially purified hereafter; since a life without body (i. e. without this gross body, and even the aërial vehicle,) is more adapted to them. If, however, some one should ask, why the poor, also, are not punished, who have the will to act unjustly, but only the powerful; since the poor, if they had instruments subservient to their will, such as wealth and the like, would likewise sin,—we reply, that the poor, also, if they had an unjust will in the present life, are punished; but the measures are different. For he whose injustice extended no farther than to his will, is not punished similarly with him whose will has proceeded into energy, and who has acted unjustly. And, lastly, the soul by suffering, becomes herself amended, and is an example to those that behold her."

I shall only observe, in addition to this admirable extract, that Olympiodorus in his MS. Commentary on the Phædo of Plato, assigns another reason why some souls are said by Plato to be punished *eternally*, which, I think, is even superior to that already given. "We must say, (he observes) that the incurable soul is punished *eternally*, calling eternity her life, and the partial period of her existence. For, in reality, souls which have offended in the highest degree cannot be sufficiently purified in one period, but *are continually in life, as it were, in Tartarus;* and this period is called by Plato eternity." Such is the philanthrophy of genuine philosophy, which no less harmonizes with our *unperverted* conceptions, than with the *goodness* of divinity. For to suppose that Divinity punishes eternally offending souls, *that are capable of being reclaimed,* (and the number of those that are incurable must be small, indeed,) is to make him a greater tyrant than Caligula, or the most execrable potentate that ever disgraced the annals of history. The abject minds that entertain such a dreadful opinion, look only to the omnipotence of deity; are ignorant that his attributes are exerted in inseparable conjunction; and that, in consequence of this, while irresistible power is the concomitant of his will, the most consummate goodness is blended with all the energies of his power.

always vivify. Hence she always has a luciform body, which is also perpetual. From what has been said, therefore, it is necessary that there should be a pneumatic body, and that from this, anger and desire should be inseparable.

It is evident, also, that as the vital and orectic powers of the irrational soul are in the pneumatic vehicle, so, likewise, the gnostic powers of this soul. For if the subordinate powers may be separated from this gross body, much more may the superior powers; and the gnostic powers, viz. phantasy and sense, are superior. Though, however, the irrational powers of the soul have their being in this pneumatic vehicle, yet certain vestiges proceed from it to this gross body; just as common conceptions proceed from intellect to all souls. For that the illuminations of the irrational life pervade as far as to this outward body, is evident. For anger, as we have before observed, moves the blood about the heart, and causes it to become fervid; and desire disposes the liver in conformity to its own motions. All the senses, likewise, illuminate the brain. For the sensitive power is imparted from the brain to the sensoria through the nerves; and when the brain is injured, the senses become unenergetic, as physicians demonstrate. And when the part pertaining to the back is injured, the superior part, indeed, of him who is hurt is still sensitive, but the inferior parts become destitute of sensation, because the sensitive power is no longer supplied from the brain, in consequence of the organ, i. e. the nerve, being injured. If, also, a nerve is tied, again the lower part is deprived of sense, but the upper part remains sensitive.

From the evidence, however, of things themselves, it is still more manifest that there is a pneumatic body, and that from this anger and desire are inseparable. For whence are shadowy phantasms seen in sepulchres[6]? For the soul is not figured, nor is, in short, visible. But unpurified souls, after their departure from this body, wander for a certain time with the pneumatic vehicle; and this becomes apparent about sepulchres. Hence every attention must be paid to rectitude of conduct in life. For the pneumatic vehicle and its spirit becoming thickened from a depraved mode of life, the soul is attracted about the passions. For this spirit possesses something of the vegetative life; since it is nourished. It is not, however, nourished like this gross body, but through vapours, not by parts, but wholly through the whole of itself, in the same manner as sponges receive vapours. On this account more worthy men pay attention to a thinner and drier diet, in order that the spirit may not be thickened, but attenuated. Hence one of the Chaldæan oracles admonishes that we should not defile *the spirit*, nor give depth to a *superficies;* by *the spirit* signifying the pneumatic vehicle of the soul, and by *the superficies*, its ethereal and lucid vehicle. For this purpose, also, purifications are to be employed. For this outward body is cleansed by water; but the pneumatic vehicle by purifications through vapours; since through some vapours it is nourished, and is purified through others. It is not, however, distributed through various instruments, but wholly energizes through the whole of itself according to the senses, and apprehends sensible objects. How, therefore, does it appear in sepulchres endued with members and organs, and sometimes in a human shape, but at other times having the form of some other animal? To this we reply, in the first place, that it frequently appears to have a human shape, in consequence of being thickened by an improper mode of living, and receiving the impression of the surrounding body; just as ice receives the impression of the vessels in which it is congealed. How, therefore, is it seen to have different forms? Perhaps when the soul wishes it to become manifest, by moving the phantasy it at the same time impresses the pneumatic vehicle. Or, perhaps, through the co-operation of some power superior to the soul, it appears, and again becomes unapparent, in consequence of becoming rarefied and condensed. For being aërial, it is rendered visible by condensation, and invisible by dispersion and rarefaction. And thus much concerning the pneumatic vehicle of the soul. Let us now return to what more immediately concerns Aristotle's treatise On the Soul.

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[6] See the Phædo of Plato, where this is asserted.

In this treatise, then, it is concluded by Aristotle, that the essence of the soul may be known from natural philosophy, so far as it is the form of animals, viz. so far as it is a form by which animals are defined, as animated beings. Of which, also, Aristotle is dubious, whether it ought to be denominated soul, or a part of soul, or that which is not without soul; so far as it has the power of increase and sensible perception, and is the cause of local motion. For so far as the soul is intellective, it is to be known by the first philosophy or metaphysics, which has a knowledge of intelligibles themselves, and of the intellect to which they are objects of contemplation; and which not only knows the intellect exempt from soul, but that likewise which is the summit of our essence. For by our intellect those intelligibles are surveyed; and the intellective and intelligible being relatives, are contemplated by one and the same science; in the same manner as the sensitive power, and the sensible object. Hence the theory of the soul is neither simply physical nor metaphysical, but adheres to both. Aristotle, however, seems by considering both physiology and metaphysics as philosophy, to elevate the former, and produce the latter as far as to soul. For it is evident that the soul is not an essential boundary, in the same manner as natural forms are the boundaries of bodies; since the latter are boundaries as of bodies, but the soul is a boundary as the form of animals. And the latter, indeed, are the principles of being moved, but soul is the principle of moving, or is the motive principle. For to be moved by themselves is the peculiarity of animated natures, as Aristotle observes in the eighth book of his Physics. Nor is the intellectual part of the soul, such as are supernatural, purely impartible, perfectly stable, and genuine forms. The science of the soul, therefore, is a medium between metaphysics and physics; just as the essence of the soul is a medium between supernatural and natural forms, and has something which communicates with the former, and something which inclines to the latter. Hence, since the intellect of the soul is considered by Aristotle, and not only the physical parts of it, it is evident that the discussion of the soul is not simply physical.

The consideration of the soul, however, which is in mortal animals, seems to be the only scope to which this treatise is directed. For Aristotle does not appear to speak of the soul of the celestial orbs, unless so far as he considers the mathematical demonstrations of Timæus about it. Perhaps, also, he was satisfied with the Platonic theory on this subject, animadverting on it only so far as was necessary to prevent the reader from adopting the *apparent* meaning of those demonstrations. And, perhaps, through what is said about the summit of our intellect, he thinks fit to lead us to a celestial soul. For the soul of the universe, says he, is [always] such, as what is called intellect sometimes is. For it is neither such as the sensitive power, nor such as that power of the soul which is the source of desire; since the soul of the universe is pure intellectual reason, which is wholly through the whole of itself, unmingled with secondary lives, because it neither verges to bodies, nor becomes any thing pertaining to them; but while it abides in itself, bodies derive their subsistence from it. Hence its motion is circular, in consequence of the conversion of the whole to the whole of itself. Nor does Aristotle appear to have discussed any thing concerning the different allotments of the human soul, or the variety of its choice in different lives; well knowing that these particulars had been sufficiently considered by his preceptor. Nor does he consider the soul as inseparable from the body. For, in the third book, he assigns the cause of our having no recollection of a separate life, indicating by this the existence of the soul prior to its connexion with the body. But he alone precedaneously discusses tho soul which is in mortals, leaving no power nor essence of it unexplored. In the first place, however, he assigns the formal cause in common in all souls, not as the cause of bodies, but of vital organs. For nature is the formal cause of bodies, so far as they are bodies, and not soul. But that which gives form to body as a vital organ, is either soul, or a part of soul, or is not without soul. And this indeed, is the formal cause, according to which the thing formalized is able to be vitally moved. The cause, however, by which the animal is moved, is different from this; for it is moved by soul, in the same manner as the ship by the pilot; the cause which moves vitally being different, as we shall learn from that by which the animal thus moved is defined[8]; since the motive power is not the same with that which is moved, but is divided about it. It is not, however, the body simply, but the living body which is moved with vital motions, such as walking, flying, and respiration. And the body is vital according to the life which it contains; so that according to this, it is vitally moved. Since, therefore, the moving power in the animal is soul, whether is this the same with that according to which it is moved, or is this impossible? For the whole animal being formalized according to this, would be both moved and motive, and the soul would not, conformably to the doctrine of Aristotle, move, but the animal be moved. The instrument, however, is different from that which uses it: and consequently the form which is characteristic as of an instrument, is different from that by which it is used. That also, which uses the instrument, is the *entelecheia* or form of it, in the same manner as the sailor is of a ship. For *entelecheia* is twofold; the one being that by which the ship exists; but the other subsisting as the sailor.

In the next place, Aristotle assigns the differences of souls, and at the same time surveys in each that which is common to all of them. And he surveys some of them, indeed, as more inclining to the organic part, but others as more established according to the power which uses that part. He also asserts that every soul is the entelecheia of an organic body, yet not every soul according to each of its powers. For he clearly says, that intellect contains nothing of body, and that it does not use the body as an instrument in its energies. He also sufficiently distinguishes whatever pertains to the intellectual power of souls; perceiving that the practical intellectual power which employs the phantasy according to the minor or partial proposition, is one thing, and the theorectic power another. This latter power, likewise, he considers as twofold, the one subsisting according to an energy proceeding from essence, this energy being either imperfect or perfect;

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[8] The cause by which *the animal is vitally* moved, is the rational soul, but the cause by which the animal thus moved is defined or bounded, is *entelecheia.*

either falling from its imperfection into a subsistence in capacity, according to the prior signification[9] of the term, or being established according to a more perfect subsistence in capacity; and either subsisting according to an energy which does not, indeed, employ the phantasy, but has it for an attendant, as being moved together with the energetic contemplation which proceeds and departs from the essence of the soul. But the other division of this power subsists according to a stable energy, collecting itself into one and the same with essence, by which it imitates the intellect exempt from soul. This power, also, is in its essence energy, according to which alone the soul is immortal, as through this being conjoined with eternal natures. And this power, indeed, always possesses stability genuinely in a separate life, but in a certain respect departing from itself in verging to subordinate natures, yet not so as in no respect to be permanent. It is, therefore, a stable nature in a secondary degree. That part of the soul, however, which verges to externals is not immortal, as being conversant with mutation, and as not being present in a separate life.

Dividing, also, the orectic from the gnostic powers of the soul, he discusses what are the loco-motive powers of animals; and the whole of this theory is completed in the second and third books. But in the first book, after having explained the scope of the treatise, and shown what are to be considered as the objects of its investigation, he also defines the mode of discussion, beginning from opposites, and through energy, as a medium leading us to the essence of the soul. He likewise, in this book, relates the opinions of the ancients concerning the soul, and through those which he admits, and those which he rejects, asserts it to be both gnostic and motive; and, besides this, that it is incorporeal, impartible, and unmoved with corporeal motions. He also demonstrates that it is neither corporeal harmony, nor corporeal composition, nor any ratio of mixture. But he asserts that it is a principle, not as an element, nor as a composite from the elements, but as reason and form. And he is of opinion that there is one soul in each animal, and that the soul in rational animals has all the vital essences and powers; according to which its appetite is rational, or is characterized by anger and desire; and according to which it knows intellectually, or doxastically, (i. e. by opinion) or imaginatively, or sensibly. And besides these, he considers the soul as in the last place possessing the physical powers.

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[9] By the prior signification of a subsistence in capacity, must be understood the condition of one who is capable of acquiring certain knowledge, for instance, the science of geometry, but has not yet acquired it; and the more perfect subsistence of knowledge in capacity, is that of a geometrician, when he does not energize geometrically.

Again, in the third book, surveying the rational part of our soul in the middle of animals that are situated in the extremes, at one time he assimilates it to the sensitive, and at another to the intellectual powers. And at one time he considers it as deviating to the sensitive power but at another as ascending to the imitation of an intellectual life; at one time contracting itself, as far as it is able, into an impartible nature, and wholly abiding in itself, when it imitates an intellect superior to itself; but at another time departing, after a manner, from itself, in verging to externals, energizing according to outward projection, and proceeding into a partible condition of being. It does not, however, in this case perfectly depart from opposites. For the separation of it is in conjunction with acontraction into the impartible; its outward projection is attended with a conversion to itself; and its apostacy from, subsists together with a permanency in itself, this being obscured when it verges to externals. This, however, is in order that it may abide, and at the same time be changed, through its middle condition between natures that abide, and those that are perfectly changed, our soul in a certain respect communicating with each of the extremes; in the same manner as it is in a certain respect divided, and becomes, as it were, at one and the same time impartible, and is without generation; is in a certain way corrupted, and is preserved incorruptible. Hence we must neither admit with Plotinus, that something belonging to it always remains pure, and in the same condition of being, nor that it entirely proceeds in verging to generation; but that it wholly proceeds, and genuinely remains, in its tendency to subordinate natures.

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CHAPTER XIII.

The next dogma of Aristotle that demands our attentio, and which is also the last and the most important of all, is that respecting the ineffable principle of things, and the mighty powers that subsists concentered and rooted in him. And in this, as well as in all his other dogmas, he coincides in reality with the doctrine of his divine master Plato, however much he may seem to oppose it.

That the reader, however, who is capable of ascending to such arduous sublimities may be perfectly convinced of this coincidence, the following epitome is added of the dogmas of Plato on this subject, as preparatory to an elucidation of the theological tenets of Aristotle. The ascent to the ineffable therefore according to Plato is as follows, beginning from that which is perfectly effable and known to sense, and establishing in silence, as in a port, the parturitions of truth concerning it. Let us then assume the following axiom, in which as in a secure vehicle we may safely pass from hence thither. I say, therefore, that the unindigent is naturally prior to the indigent. For that which is in want of another is naturally adapted from necessity to be subservient to that of which it is indigent. But if they are mutually in want of each other, each being indigent of the other, in a different respect, neither of them will be the principle. For the unindigent is most adapted to that which is truly the principle. And if it is in want of any thing, according to this it will not be the principle. It is however necessary that the principle should be this very thing, the principle alone. The unindigent therefore pertains to this, nor must it by any means be acknowledged that there is any thing prior to it. This however would be acknowledged, if it had any connection with the indigent.

Let us then consider body[1], that is a triply extended substance, endued with quality; for this is the first thing effable by us, and is sensible. Is this then the principle of things? But it is two things, body, and quality which is in body as a subject. Which of these, therefore, is by nature prior? For both are indigent of their proper parts; and that also which is in a subject is indigent of the subject. Shall we say then that body itself is the principle and the first essence? But this is impossible. For in the first place, the principle will not receive any thing from that which is posterior to itself. But body, we say, is the recipient of quality. Hence quality, and a subsistence in conjunction with it, are not derived from body, since quality is present with body as something different. And in the second place, body is every way divisible, its several parts are indigent of each other, and the whole is indigent of all the parts. As it is indigent, therefore, and receives its completion from things which are indigent, it will not be entirely unindigent.

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[1] See Damascius περι αρχων, and the Introduction to my translation of Plato.

Farther still, if it is not one but united, it will require, as Plato says, the connecting one. It is likewise something common and formless, being as it were a certain matter. It requires therefore ornament, and the possession of form, that it may not be merely body, but a body with a certain particular quality; as for instance, a fiery or earthly body, and in short, body adorned and invested with a particular quality. Hence the things which accede to it finish and adorn it. Is then that which accedes the principle? But this is impossible. For it does not abide in itself, nor does it subsist alone, but is in a subject, of which also it is indigent. If, however, some one should assert, that body is not a subject, but one of the elements in each individual, as for instance, animal in horse and man, thus also each will be indigent of the other, viz. this subject and that which is in the subject; or rather the common element, animal, and the peculiarities, as the rational and irrational, will be indigent. For elements are alway indigent of each other, and that which is composed from elements is indigent of the elements. In short, this sensible nature, and which is so manifest to us, is neither body; for this does not of itself move the senses; nor quality; for this does not possess an interval commensurate with sense.

Hence, that which is the object of sight, is neither body nor colour; but coloured body, or colour corporalized, is that which is motive of the sight; and universally that which is sensible, which is body with a particular quality, is motive of sense. From hence it is evident that the thing which excites the sense is something incorporeal. For if it was body, it would not yet be the object of sense. Body therefore requires that which is incorporeal, and that which is incorporeal, body. For an incorporeal nature is not of itself sensible. It is however different from body, because these two possess prerogatives different from each other, and neither of these subsists prior to the other; but being elements of one sensible thing, they are present with each other; the one imparting interval to that which is void of interval, but the other introducing to that which is formless, sensible variety invested with form. In the third place, neither are both these together the principle: since they are not unindigent. For they stand in need of their proper elements, and of that which conducts them to the generation of one form. For body cannot effect this, since it is of itself impotent, nor quality, since it is not able to subsist separate from the body in which it is, or together with which it has its being. The composite therefore either produces itself, which is impossible, for it does not converge to itself, but the whole of it is multifariously dispersed, or it is not produced by itself, and there is some other principle prior to it.

Let it then be supposed to be that which is called nature, being a principle of motion and rest, in that which is moved and at rest, essentially and not according to accident. For this is something more simple, and is fabricative of composite forms. If, however, it is in the things fabricated, and does not subsist separate from nor prior to them, but stands in need of them for its being, it will not be unindigent; though it possesses something transcendent with respect to them, viz. the power of fashioning and fabricating them. For it has its being together with them, and has in them an inseparable subsistence; so that when they are it is, and is not when they are not, and this in consequence of perfectly verging to them, and not being able to sustain that which is appropriate. For the power of increasing, nourishing, and generating similars, and the one prior to these three, viz. nature, is not wholly incorporeal, but is nearly a certain quality of body, from which it alone differs, in that it imparts to the composite to be inwardly moved and at rest. For the quality of that which is sensible imparts that which is apparent in matter, and that which falls on sense. But body imparts interval every way extended; and nature, an inwardly proceeding natural energy, whether according to place only, or according to nourishing, increasing, and generating things similar. Nature, however is inseparable from a subject, and is indigent, so that it will not be in short the principle, since it is indigent of that which is subordinate. For it will not be wonderful, if being a certain principle it is indigent of the principle above it; but it would be wonderful if it were indigent of things posterior to itself, and of which it is supposed to be the principle.

By the like arguments we may show that the principle cannot be irrational soul, whether sensitive, or orectic. For if it appears that it has something separate, together with impulsive and gnostic energies, yet at the same time, it is bound in body, and has something inseparable from it; since it is not able to convert itself to itself, but its energy is mingled with its subject. For it is evident that its essence is something of this kind; since if it were liberated, and in itself free, it would also evince a certain independent energy, and would not always be converted to body; but sometimes it would be converted to itself. Or, though it were always converted to body, yet it would judge and explore itself. The energies therefore of the multitude of mankind, though they are conversant with externals, yet at the same time they exhibit that which is separate about them. For they consult how they should engage in them, and observe that deliberation is necessary, in order to effect or be passive to apparent good, or to decline something of the contrary. But the impulses of other irrational animals are uniform and spontaneous, are moved together with the sensible organs, and require the senses alone that they may obtain from sensibles the pleasurable, and avoid the painful. If, therefore, the body communicates in pleasure and pain, and is affected in a certain respect by them, it is evident that the psychical energies (i. e. energies belonging to the soul) are exerted, mingled with bodies, and are not purely psychical, but are also corporeal; for perception is of the animated body, or of the soul corporalized, though in such perception the psychical property predominates over the corporeal; just as in bodies the corporeal property has dominion according to interval and subsistence. As the irrational soul therefore has its being in something different from itself, so far it is indigent of the subordinate. But a thing of this kind will not be the principle.

Prior then to this essence, we see a certain form separate from a subject, and converted to itself, such as is the rational nature. Our soul, therefore, presides over its proper energies, and corrects itself. This, however, would not be the case, unless it was converted to itself. And it would not be converted to itself, unless it had a separate essence. It is not, therefore, indigent of the subordinate. Shall we then say, that it is the most perfect principle? But it does not at once exert all its energies, but is always indigent of the greater part. The principle, however, wishes to have nothing indigent. But the rational nature is an essence in want of its own energies. Some one, however, may say that it is an eternal essence, and has never failing essential energies, always concurring with its essence, according to the self-moved and ever vital, and that it is therefore unindigent, and will be the principle. To this we reply, that the whole soul is one form and one nature, partly unindigent and partly indigent; but the principle is perfectly unindigent. Soul, therefore, and which exerts mutable energies, will not be the most proper principle. Hence it is necessary that there should be something prior to this, which is in every respect immutable, according to nature, life, and knowledge, and according to all powers and energies, such as we assert an eternal and immutable essence to be, and such as is much-honoured intellect, to which Aristotle having ascended, thought he had discovered the first principle. For what can be wanting to that which perfectly comprehends in itself its own plentitudes (πληρωματα), and of which neither addition nor ablation changes any thing belonging to it? Or is not this also, one and many, whole and parts, containing in itself, things first, middle, and last? The subordinate plentitudes also stand in need of the more excellent, and the more excellent of the subordinate, and the whole of the parts. For the things related are indigent of each other, and what are first of what are last, through the same cause; for it is not of itself that which is first. Besides, *the one* here is indigent of *the many*, because it has its subsistence in *the many*. Or it may be said, that this one is collective of the many, and this not by itself, but in conjunction with them. Hence there is much of the indigent in this principle. For since intellect generates in itself its proper plentitudes, from which the whole at once receives its completion, it will be itself indigent of itself, not only that which is generated of that which generates, but also that which generates of that which is generated, in order to the whole completion of that which wholly generates itself. Farther still, intellect understands and is understood, is intellective of, and intelligible to itself, and both these. Hence the intellectual is indigent of the intelligible, as of its proper object of desire; and the intelligible is in want of the intellectual, because it wishes to be the intelligible of it. Both also are indigent of either, since the possession is always accompanied with indigence, in the same manner as the world is always present with matter. Hence a certain indigence is naturally co-essentialized with intellect, so that it cannot be the most proper principle. Shall we therefore, in the next place, direct our attention to the most simple of beings, which Plato calls *the one being*, *εν ον*? For as there is no separation there throughout the whole, nor any multitude, or order, or duplicity, or conversion to itself, what indigence will there appear to be in the perfectly united? And especially what indigence will there be of that which is subordinate? Hence the great Parmenides ascended to this most safe principle, as that which is most unindigent. Is it not, however, here necessary to attend to the conception of Plato, that the united is not *the one itself*, but that which is passive[2] to it? And this being the case, it is evident that it ranks after *the one*; for it is supposed to be *the united*, and not *the one itself*. If also *being* is composed from the elements *bound* and *infinity*, as appears from the Philebus of Plato, where he calls it that which is mixt, it will be indigent of its elements. Besides, if the conception of *being*, is different from that of *being united*, and that which is a whole is both united and being, these will be indigent of each other, and the whole which is called *one being* is indigent of the two. And though *the one* in this is better than *being*, yet this is indigent of being, in order to the subsistence of one being. But if *being* here supervenes *the one*, as it were form in that which is mixt and united, just as the property of man in that which is collectively rational—mortal—animal, thus also *the one* will be indigent of *being*. If, however, to speak more properly, *the one* is two-fold, *this* being the cause of the mixture, and subsisting prior to being, but *that* conferring rectitude on being—if this be the case, neither will the indigent perfectly desert this nature. After all these, it may be said that *the one* will be perfectly unindigent. For neither is it indigent of that which is posterior to itself for its subsistence, since the truly one is by itself separated from all things; nor is it indigent of that which is inferior or more excellent in itself; for there is nothing in it besides itself; nor is it in want of itself. But it is one, because neither has it any duplicity with respect to itself. For not even the relation of itself to itself must be asserted of the truly one; since it is perfectly simple. This, therefore, is the most unindigent of all things. Hence, this is the principle and the cause of all; and this is at once the first of all things. If these qualities, however, are present with it, it will not be *the one*. Or may we not say that all things subsist in *the one* according to *the one?* And that both these subsist in it, and such other things as we predicate of it, as for instance, the most simple, the most excellent, the most powerful, the preserver of all things, and the good itself? If these things, however, are thus true of *the one*, it will thus also be indigent of things posterior to itself, according to those very things which we add to it. For the principle is, and is said to be the principle of things proceeding from it, and the cause is the cause of things caused, and the first is the first of things arranged posterior to it[3]. Farther still, the simple subsists according to a transcendency of other things, the most powerful according to power with relation to the subjects of it; and the good, the desirable, and the preserving, are so called with reference to things benefitted, preserved, and desiring. And if it should be said to be all things according to the pre-assumption of all things in itself, it will indeed be said to be so according to *the one* alone, and will at the same time be the one cause of all things prior to all, and will be this and no other according to *the one*. So far, therefore, as it is *the one* alone, it will be unindigent; but so far as unindigent, it will be the first principle and stable root of all principles. So far, however, as it is the principle and the first cause of all things, and is pre-established as the object of desire to all things, so far it appears to be in a certain respect indigent of the things to which it is related. It has, therefore, if it be lawful so to speak, an ultimate vestige of indigence, just as on the contrary matter has an ultimate echo of the unindigent, or a most obscure and debile impression of *the one*. And language indeed appears to be here subverted. For so far as it is *the one*, it is also unindigent, since the principle has appeared to subsist according to the most unindigent and *the one*. At the same time, however, so far as it is *the one*, it is also the principle; and so far as it is *the one*, it is unindigent, but so far as the principle, indigent. Hence, so far as it is unindigent, it is also indigent, though not according to the same; but with respect to being that which it is, it is unindigent; but as producing and comprehending other things in itself it is indigent. This, however, is the peculiarity of *the one*; so that it is both unindigent and indigent according to *the one*. Not indeed that it is each of these, in such a manner as we divide it in speaking of it, but it is one alone; and according to this is both other things, and that which is indigent. For how is it possible it should not be indigent also so far as it is *the one*?

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[2] See the Sophista of Plato, where this is asserted.

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[3] For a thing cannot be said to be a principle or cause without the subsistence of the things of which it is the principle or cause. Hence, so far as it is a principle or cause it will be indigent of the subsistence of these.

just as it is all other things which proceed from it. For the indigent also is something belonging to all things. Something else, therefore, must be investigated which in no respect has any kind of indigence. But of a thing of this kind, it cannot with truth be asserted that it is the principle, nor can it even be said of it that it is most unindigent, though this appears to be the most venerable of all assertions[4]. For this signifies transcendency, and an exemption from the indigent. We do not, however, think it proper to call this even *the perfectly exempt;* but that which is in every respect incapable of being apprehended, and about which we must be perfectly silent, will be the most just axiom of our conception in the present investigation; nor yet this as uttering any thing, but as rejoicing in not uttering, and by this venerating that immense unknown. This then is the mode of ascent to that which is called the first, or rather to that which is beyond every thing which can be conceived, or become the subject of hypothesis.

There is also another mode, which does not place the unindigent before the indigent, but considers that which is indigent of a more excellent nature, as subsisting secondary to that which is more excellent. Every where then that which is in capacity is secondary to that which is in energy. For that it may proceed into energy, and that it may not remain in capacity in vain, it requires that which is in energy. For the more excellent never blossoms from the subordinate nature. Let this then be previously defined by us, according to common unperverted conceptions. Matter, therefore, has, prior to itself, material form; because all matter is form in capacity, whether it be the first matter which is perfectly formless, or the second which subsists according to body void of quality, or in other words, mere triple extension, to which it is likely those directed their attention who first investigated sensibles, and which at first appeared to be the only thing that had a subsistence. For the existence of that which is common in the different elements, persuaded them that there is a certain body void of quality. But since among bodies of this kind, some possess the governing principle inwardly, and others externally, such as things artificial, it is necessary besides quality, to direct our attention to nature, as being something better than qualities, and which is pre-arranged in the order of cause, as art is of things artificial. Of things, however, which are inwardly governed, some appear to possess being alone, but others to be nourished and increased, and to generate things similar to themselves. There is, therefore, another certain cause prior to the above-mentioned nature, viz. a vegetable power itself. But it is evident that all such things as are ingenerated in body as in a subject, are of themselves incorporeal, though they become corporeal, by the participation of that in which they subsist, so that they are said to be and are material in consequence of what they suffer from matter. Qualities, therefore, and still more natures, and in a still greater degree the vegetable life, preserve the incorporeal in themselves. Since, however, sense exhibits another more conspicuous life, pertaining to beings which are moved according to impulse and place, this must be established prior to that, as being a more proper principle, and as the supplier of a certain better form, and that of a self-moved animal, and which naturally precedes plants rooted in the earth. The animal, however, is not accurately self-moved. For the whole is not such through the whole; but a part moves, and a part is moved. This, therefore, is the apparent self-moved. Hence, prior to this, it is necessary there should be that which is truly self-moved, and which according to the whole of itself moves and is moved, that the apparently self-moved may be the image of this. And indeed the soul which moves the body, must be considered as a more proper self-moved essence. This, however, is twofold, the one rational, the other irrational. For that there is a rational soul is evident. Or has not every one a co-sensation of himself, more clear or more obscure, when converted to himself in the attentions to and investigations of himself, and in the vital and gnostic animadversions of himself; for the essence which is capable of this, and which can collect universals by reasoning, will very justly be rational. The irrational soul also, though it does not appear to investigate these things, and to reason with itself, yet at the same time it moves bodies from place to place, being itself previously moved from itself; for at different times it exerts a different impulse. Does it, therefore, move itself from one impulse to another? or is it moved by something else, as for instance, by the whole rational soul in the universe? But it would be absurd to say, that the energies of every irrational soul are not the energies of that soul, but of one more divine; since they are infinite, and mingled with much of the base and imperfect. For this would be just the same as to say, that the irrational energies are the energies of the rational soul. I omit to mention the absurdity of supposing that the whole essence is not generative of its proper energies. For if the irrational soul is a certain essence, it will have peculiar energies of its own, not imparted from something else, but proceeding from itself. The irrational soul, therefore, will also move itself, and at different times to different impulses. But if it moves itself, it will be converted to itself. If, however, this be the case, it will have a separate subsistence, and will not be in a subject. It is, therefore, rational, if it looks to itself: for in being converted to, it surveys itself. For when extended to things external, it looks to externals, or rather it looks to coloured body, but does not see itself, because sight itself is neither body, nor that which is coloured. Hence, it does not revert to itself. Neither, therefore, is this the case with any other irrational nature. For neither does the phantasy project a type of itself, but of that which is sensible, as for instance of coloured body. Nor does irrational appetite desire itself, but aspires after a certain object of desire, such as honour, or pleasure, or riches. It does not, therefore, move itself.

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[4] See the extracts from Damascius, in the additional notes to the third volume of my Plato, which contain an inestimable treasury of the most profound conceptions concerning the ineffable.

But if some one on seeing that brutes exert rational energies, should apprehend that these also participate of the first self-moved, and on this account possess a soul converted to itself, it may, perhaps, be granted to him that these also are rational natures, except that they are not so essentially, but according to participation, and this most obscure, just as the rational soul may be said to be intellectual according to participation, as always projecting common conceptions without distortion. It must, however, be observed that the extremes are, that which is capable of being perfectly separated, such as the rational form, and that which is perfectly inseparable, such as corporeal quality, and that in the middle of these nature subsists, which verges to the inseparable, having a small representation of the separable, and the irrational soul which verges to the separable; for it appears in a certain respect to subsist by itself, separate from a subject; so that it becomes doubtful whether it is self-motive, or alter-motive. For it contains an abundant vestige of self-motion, but not that which is true, and converted to itself, and on this account perfectly separated from a subject. And the vegetable soul has in a certain respect a middle subsistence. On this account, to some of the ancients it appeared to be a certain soul, but to others, nature.

Again, therefore, that we may return to the proposed object of investigation, how can a self-motive nature of this kind, which is mingled with the alter-motive, be the first principle of things? For it neither subsists from itself, nor does it in reality perfect itself; but it requires a certain other nature both for its subsistence and perfection. And prior to it is that which is truly self-moved. Is, therefore, that which is properly self-moved the principle, and is it indigent of no form more excellent than itself? Or is not that which moves always naturally prior to that which is moved; and in short, does not every form which is pure from its contrary subsist by itself prior to that which is mingled with it? And is not the pure the cause of the co-mingled? For that which is co-essentialized with another, has also an energy mingled with that other. So that a self-moved nature will indeed make itself; but thus subsisting it will be at the same time moving and moved, but will not be made a moving nature only. For neither is it this alone. Every form, however, is always alone according to its first subsistence; so that there will be that which moves only without being moved. And indeed it would be absurd that there should be that which is moved only, such as body, but that prior both to that which is self-moved and that which is moved only, there should not be that which moves only. For it is evident that there must be, since this will be a more excellent nature, and that which is self-moved, so far as it moves itself, is more excellent than so far as it is moved. It is necessary, therefore, that the essence which moves unmoved should be first, as that which is moved, not being motive, is the third, in the middle of which is the self-moved, which we say requires that which moves in order to its becoming motive. In short, if it is moved, it will not abide, so far as it is moved; and if it moves, it is necessary it should *remain* moving so far as it moves. Whence then does it derive the power of *abiding?* For from itself it derives the power either of being moved only, or of at the same time abiding and being moved wholly according to the same. Whence then does it simply obtain the power of abiding? Certainly from that which simply abides. But this is an immoveable cause. We must therefore admit that the immoveable is prior to the self-moved. Let us consider then if the immoveable is the most proper principle. But how is this possible? For the immoveable contains as numerous a multitude immoveably, as the self-moved self-moveably. Besides, an immoveable separation must necessarily subsist prior to a self-moveable separation. The unmoved therefore is at the same time one and many, and is at the same time united and separated; and a nature of this kind is denominated intellect. But it is evident that the united in this, is naturally prior to and more honourable than the separated. For separation is always indigent of union; but not, on the contrary, union of separation. Intellect, however, has not the united pure from its opposite; for intellectual form is co-essentialized with the separated through the whole of itself. Hence, that which is in a certain respect united, requires that which is simply united; that which subsists with another is indigent of that which subsists by itself; and that which subsists according to participation of that which subsists according to essence. For intellect being self-subsistent, produces itself as united and at the same time separated. Hence it subsists according to both these. It is produced, therefore, from that which is simply united and alone united. Prior, therefore, to that which is formal is the uncircumscribed and undistributed into forms. And this is that which we call the united, and which the wise men of antiquity denominated *being*, possessing in one contraction multitude subsisting prior to the many.

Having, therefore, arrived thus far, let us here rest for awhile, and consider with ourselves whether being is the investigated principle of all things: for what will there be which does not participate of being? May we not say, that this, if it is the united, will be secondary to *the one*, and that by participating of *the one* it becomes the united? But, in short, if we conceive *the one* to be something different from being, if being is prior to *the one* it will not participate of *the one*. It will, therefore, be many only, and these will be infinitely infinites. But if *the one* is with *being*, and *being* with *the one*, and they are either co-ordinate or divided from each other, there will be two principles, and the above-mentioned absurdity will happen. Or they will mutually participate of each other, and there will be two elements. Or they are parts of something else consisting from both. And if this be the case what will that be which leads them to union with each other. For if *the one* unites being to itself (for this may be said) *the one* also will energize prior to being, that it may call forth and convert being to itself. *The one*, therefore, will subsist from itself self-perfect prior to being. Farther still, the more simple is always prior to the more composite. If, therefore, they are similarly simple, there will either be two principles, or one from the two, and this will be a composite. Hence the simple and perfectly incomposite is prior to this, which must be either one, or not one; and if not one, it must either be many or nothing. But with respect to nothing, if it signifies that which is perfectly void, it will signify something vain. But if it signifies the arcane, this will not even be that which is simple. In short, we cannot conceive any principle more simple than *the one*. *The one*, therefore, is in every respect prior to *being*. Hence this is the principle of all things, and Plato, recurring to this, did not require any other principle in his reasonings. For the arcane, in which this our ascent terminates, is not the principle of reasoning, nor of knowledge, nor of animals, nor of beings, nor of unities, but simply of all things, being arranged above every conception and suspicion that we can frame. Hence Plato indicates nothing concerning it, but makes his negations of all other things except *the one* from *the one*. For that *the one* is he denies in the last place, but he does not make a negation of *the one*. He also, besides this, even denies this negation, but not *the one*. He denies, too, name, and conception, and all knowledge, and what can be said more, whole itself and every being. But let there be the united and the unical, and, if you will, the two principles *bound* and *the infinite*. Plato, however, never in any respect makes a negation of *the one* which is beyond all these. Hence in the Sophista he considers it as *the one* prior to being, and in the Republic as *the good* beyond every essence; but at the same time *the one* alone is left. Whether, however, is it known and effable, or unknown and ineffable? Or is it in a certain respect these, and in a certain respect not? For by a negation of this it may be said the ineffable is affirmed. And again, by the simplicity of knowledge it will be known or suspected, but by composition perfectly unknown. Hence neither will it be apprehended by negation. And, in short, so far as it is admitted to be one, so far it will be co-arranged with other things which are the subject of position: for it is the summit of things which subsist according to position. At the same time there is much in it of the ineffable and unknown, the unco-ordinated, and that which is deprived of position, but these are accompanied with a representation of the contraries; and the former are more excellent than the latter. But everywhere things pure subsist prior to their contraries, and such as are unmingled to the co-mingled. For either things more excellent subsist in *the one* essentially, and in a certain respect the contraries of these also will be there at the same time; or they subsist according to participation, and are derived from that which is first a thing of this kind. Prior to *the one*, therefore, is that which is simply and perfectly ineffable, without position, unco-ordinated, and incapable of being apprehended, to which also the ascent of the present discourse hastens through the clearest indications, omitting none of those natures between the first and the last of things.

Such then is the ascent to the highest god according to the theology of Plato, as I have elsewhere observed[5], venerably preserving his ineffable exemption from all things, and his transcendency which cannot be circumscribed by any gnostic energy; and at the same time unfolding the paths which lead upwards to him, and enkindling that luminous summit of the soul, by which she is conjoined with the incomprehensible one.

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[5] See the Introduction to my translation of Plato.

From this truly ineffable principle exempt from all essence, power and energy, a multitude of divine natures, according to Plato, immediately proceeds. For in the 6th book of his Republic, he affirms in the most clear and unequivocal terms, that *the good*, or the ineffable principle of things, is superessential, and shows by the analogy of the sun to *the good*, that what *light* and *sight* are in the visible, that *truth* and *intelligence* are in the intelligible world. As *light*, therefore, immediately proceeds from the sun, and wholly subsists according to a solar characteristic, so *truth*, or the immediate progeny of *the good*, must subsist according to a superessential property. And as *the good* according to Plato, is the same with *the one*, as is evident from his Parmenides, the immediate progeny of *the one* will be the same as that of *the good*. But the immediate offspring of *the one* cannot be any thing else than unities. And hence we necessarily infer that according to Plato, the immediate offspring of the ineffable principle of things are *superessential unities*. They differ, however, from their immense principle in this, that he is superessential and ineffable, without any addition; but this divine multitude is participated by the several orders of being, which are suspended from and produced by it. Hence, in consequence of being connected with *multitude* through this participation, they are necessarily subordinate to *the one*.

No less admirably, therefore, than Platonically, does Simplicius, in his Commentary on Epictetus, observe on this subject as follows: "The fountain and principle of all things is *the good*: for that which all things desire, and to which all things are extended, is the principle and the end of all things. *The good*, also, produces from itself all things, first, middle, and last. But it produces such as are first and proximate to itself, similar to itself; one goodness, many goodnesses, one simplicity and unity which transcends all others, many unities, and one principle many principles. For *the one*, the principle, *the good*, and deity, are the same: for deity is the first and the cause of all things. But it is necessary that the first should also be most simple; since whatever is a composite and has multitude is posterior to *the one*. And multitude and things which are not good, desire *the good* as being above them: and, in short, that which is not itself the principle is from the principle.

But it is also necessary that the principle of all things should possess the highest, and all, power. For the amplitude of power consists in producing all things from itself, and in giving subsistence to similars prior to things which are dissimilar. Hence, the one principle produces many principles, many simplicities, and many goodnesses, proximately from itself. For since all things differ from each other, and are multiplied with their proper differences, each of these multitudes is suspended from its one proper principle. Thus, for instance, all beautiful things whatever and wherever they may be, whether in souls or in bodies, are suspended from one fountain of beauty. Thus too, whatever possesses symmetry, and whatever is true, and all principles, are in a certain respect connate with the first principle, so far as they are principles and fountains and goodnesses, with an approximate subjection and analogy. For what the one principle is to all beings, that each of the other principles is to the multitude comprehended under the characteristic of its principle. For it is impossible, since each multitude is characterized by a certain difference, that it should not be extended to its proper principle, which luminously imparts one and the same form to all the individuals of that multitude. For *the one* is the leader of every multitude; and every peculiarity in the many, is derived to the many from *the one*. All partial principles, therefore, are established in that principle which ranks as a whole, and are comprehended in it, not with interval and multitude, but as parts in the whole, as multitude in *the one*, and number in the monad. For this first principle is all things prior to all: and many principles are multiplied about the one principle, and in the one goodness, many goodnesses are established. This, too, is not a certain principle like each of the rest:

for of these, one is the principle of beauty, another of symmetry, another of truth, and another of something else, but it is simply *principle*. *Nor is it simply the principle of beings, but it is the principle of principles.* For it is necessary that the peculiarity of principle, after the same manner as other things, should not begin from multitude, but should be collected into one monad as a summit, and which is the principle of principles.

Such things, therefore, as are first produced by the first good, in consequence of being connascent with it, do not recede from essential goodness, since they are immoveable and unchanged, and are eternally established in the same blessedness. They are, likewise, not indigent of the good, because they are goodnesses themselves. All other natures, however, being produced by the one good, and many goodnesses, since they fall off from essential goodness, and are not immoveably established in the nature of divine goodness, on this account they possess the good according to participation."

The vast empire of deity, therefore, according to Plato, is terminated upwards by a principle so ineffable that all language is subverted about it, and downwards by the material world. Immediately, too, after this immense unknown, a mighty all-comprehending one subsists, which as being next to that which is in every respect incomprehensible, possesses much of the ineffable and unknown. From this principle of principles, in which all things causally subsist absorbed in superessential light, and involved in unfathomable depths, a beauteous progeny of principles proceeds, all largely partaking of the ineffable, all stamped with the occult characters of deity, all possessing an overflowing fulness of good. From these dazzling summits, these ineffable blossoms, these divine propagations, being, life, intellect, soul, nature and body, depend; as *monads* suspended from unities, deified natures proceeding from deities. Each of these monads, too, is the leader of a series which extends from itself to the last of things, and which while it proceeds from, at the same time abides in, and returns to its leader. And all these principles and all their progeny, are finally centered and rooted by their summits in the first great all-comprehending one. Thus, all beings proceed from, and are comprehended in the first being; all intellects emanate from one first intellect; all souls from one first soul; all natures blossom from one first nature; and all bodies proceed from the vital and luminous body of the world. And lastly, all these great monads are comprehended in the first one, from which both they and all their depending series are unfolded into light. Hence this first one is truly the unity of unities, the monad of monads, the principle of principles, the God of Gods, one and all things, and yet one prior to all.

Such, according to Plato, are the flights of the true philosopher, such the august and magnificent scene which presents itself to his view. By ascending these luminous heights, the spontaneous tendencies of the soul to deity alone find the adequate object of their desire; investigation here alone finally reposes, doubt expires in certainty, and knowledge loses itself in the ineffable.

With these dogmas of his divine master, Aristotle also accords, though they are not in any of his writings copiously discussed by him. This, however, was in consequence of his never being willing to depart from nature, as we have already observed, but even contemplating things which transcend nature, through a natural habit and knowledge; just as on the contrary Plato contemplated whatever is natural, so far as it partakes of that which is divine and above nature. Perhaps too, he designedly avoided an ample discussion of these doctrines, in consequence of being fully convinced that they had been most satisfactorily promulgated in the writings of Plato; to which I am persuaded Aristotle intended his own works should be considered as an Introduction.

That Aristotle then accords with Plato in the dogma that the principle of all things is superessential is evident, as Simplicius well observes from the end of his treatise On Prayer, in which he clearly says, "That God is either intellect, or *something above intellect*[1]." Aristotle, therefore, as it appears to me, being silent about the truly ineffable principle

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[1] παρα τοις εσχατοις του βιϐλιου περι προσευχης διαρρηδην λεγων, οτι ο ϑεος νους εϛιν, ἢ τι και υπερ νουν. Simplic. in Aristot. De Cœlo, p. 118. b. This work of Aristotle is unfortunately lost.

of things conformably to some of the most pious of the ancient theologists and philosophers, indicates nothing about it, but in the 12th book of his Metaphysics ascends to the summit of the intelligible order[7], or the *one being* of Parmenides and Plato, and exclaiming that the domination of many is not good, and celebrating the union of this cause, very properly there surveys as the same, intellect and the intelligible essence, power and energy. This is evident from the following citations from the 7th chapter of that book: "There is, therefore, something which moves. But since there is that which is moved, that which moves, and that which subsists as a medium between these, hence there is something which moves without being moved, which is eternal, and which is essence and energy. But it moves in the following manner: That which is desirable and that which is intelligible move without being moved. But the first intelligible is the same as the first desirable; for that which *appears* to be beautiful is desirable. But the first object of the will is that which is *really beautiful.* However, we rather aspire after it because it appears to be beautiful, than it appears to be beautiful because we aspire after it. For the principle is intelligence; but intellect is moved by the intelligible. And the other co-ordination[8] is essentially intelligible. To this co-ordination also the first essence belongs, and likewise that which subsists simply and according to energy. But, that in immoveable natures there is that for the sake of which other things subsist, division manifests: for there is something to which *that for the sake of which a thing is done* belongs, of which the one is different from the other[9]. But the first mover moves as that which is beloved; and through that which is moved it moves other things. But if there is any thing which is moved, it may subsist in a various manner. If, therefore, the first lation is energy, so far as it is moved, it may subsist differently according to place, though not according to essence. But since there is something which moves, itself at the same time being immoveable, and subsisting in energy, this cannot subsist in a various manner: for lation is the first of mutations; and of this that which is circular. But this the first mover moves. Hence, he is necessarily being; and so far as he necessarily subsists, so far he subsists according to rectitude, and is thus the principle of things; for the necessary is multifarious. For it either signifies that which is effected by violence, because contrary to the will; or that without which a thing is not well conditioned; or that which does not admit of a various, but possesses a simplicity of, subsistence. From such a principle, therefore, heaven and nature are suspended.

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[7] Concerning this order, see my translation of the Parmenides of Plato.

[8] By the other co-ordination Aristotle means the co-ordination of the beautiful, to which, according to the Pythagoreans, essence, light, triangle, the odd number, &c. belong.

[9] That is to say, that for the sake of which a thing is effected is different from the thing effected.

But the life which he lives is the most excellent, and such as we enjoy [1] for a small portion of time; for such a life is with him perpetual. To us, indeed, this is impossible; but not to the first mover, because his energy is pleasure [2]. And on this account, vigilance, the energies of sense, and intellection, are most delightful. Hope, too, and memory are pleasing through energies. But essential intellection is the intellection of that which is essentially the most excellent; and the most essential of that which is most essential. Intellect, too, understands itself by the assumption of the intelligible: for it becomes intelligible by contact and intellection; so that intellect is the same with the intelligible. For intellect is the recipient of the intelligible, and of essence. But it energizes possessing. Hence, that which intellect appears to possess as divine, belongs more eminently to the first intellect than to ours: and his contemplation is the most delightful, and the best. If, therefore, God always possesses that excellent condition of being which we sometimes possess, it is admirable; but, if he possesses it in a still higher degree, it is still more admirable. In this manner, however, he subsists.

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[1] That is: When from the exercise of the cathartic and theoretic virtues intellect passes into contact with intelligibles, or, in other words, with those separate incorporeal forms which are the causes of the sensible universe, then it becomes intelligibles in energy, and enjoys the most excellent and blessed life, the felicity of which is indescribable, and is only known to those who are capable of such an exalted energy; for intellect may then be said to be inebriated, and to deify itself with nectar.

[2] For, since the employment or energy of the first intellect is alone the intellection of himself, i. e. an eternal and all-comprehensive view of the divine forms contained in the unfathomable depths of his essence, and since this very energy is pleasure, hence in this pleasure he perpetually lives.

Life also is present with him; for the energy of intellect is life; and he is energy. But essential energy is his most excellent and eternal life; and we say that God is an animal eternal, and the most excellent; so that life and duration continued and eternal are present with God. For God is this."

Aristotle, therefore, as we have said, ascending no higher than the summit of the intelligible order, in which intellect and the intelligible, essence, power, and energy, are the same, conformably to this celebrates (in the 10th book of his Nicomachean Ethics) the energy of the cause of all things as contemplative. "For, says he, the energy of God, since it excels in blessedness, will be contemplative[3]." Aristotle likewise agreeably to Plato asserts, that the nature of God is all comprehensive. For in the 14th chapter of the 7th book of his Eudemian Ethics, he has these remarkable words: "It is evident, therefore, that as God is in the whole of things, so likewise, *every thing is in him.* For that which is divine moves in a certain respect every thing that is in us. But the principle of reason is not reason, but something of a more excellent nature. What therefore can any one assign more excellent than science, except God[4]?"

CHAPTER XIV.

HAVING shown what the doctrines of Aristotle is respecting the first cause of all things, let us in the next place survey what he asserts of those mighty powers that proceed from this cause, and are eternally concentered and rooted in it. In the 8th chapter, therefore, of the 12th book of his Metaphysics, he writes on this subject as follows: "We ought not to be ignorant whether one essence of this kind [i. e. an eternal, immoveable, essence separated from sensibles] is to be admitted, or more than one, and if more than one, how many. The principle and the first of beings is immoveable, both essentially and according to accident; but he moves the first, eternal and single motion. But since that which is moved must necessarily be moved by something, and that which first moves is essentially immoveable, and an eternal motion must be moved by an eternal mover, and one by one; and since we see that besides the simple lation of the universe, which we say the first and immoveable essence moves, there are also other eternal lations of the planets, (for a body which resolves in a circle is eternal and unstable, as has been shown in the Physics) since this is the case, *it is necessary that each of these lations should be moved by an essentially immoveable and eternal essence.* For *the nature of the stars is a certain eternal essence*, and that which moves is perpetual, and prior to that which is moved; and that which has a priority of essence is necessarily essence. *It is evident, therefore, that there are* NECESSARILY *so many essences, naturally eternal, essentially immoveable, and without magnitude*, for the reason already assigned[5]. And he concludes this chapter in the following remarkable words: "OUR ANCESTORS AND MEN OF GREAT ANTIQUITY, HAVE LEFT US A TRADITION INVOLVED IN FABLE, THAT THESE FIRST ESSENCES ARE GODS, AND THAT THE DIVINITY COMPREHENDS THE WHOLE OF NATURE. *The rest indeed is fabulously in-*

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[3] ωστε η του θεου ενεργεια, μακαριοτητι διαφερουσα, θεωρητικη αν ειη.

[4] δηλον δη ωσπερ εν τῳ ολῳ θεος, και παν εκεινῳ. κινει γαρ πως παντα το εν ημιν θειον. (lege παντα τα εν ημιν το θειον.) λογου δε αρχη ου λογος, αλλα τι κρειττον. τι ουν αν κρειττον και επιστημης ειποι, πλην θεος;

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[5] ποτερον δε μια θετεον την τοιαυτην ουσιαν η πλειους, και ποσας, δει μη λανθανειν.—η μεν γαρ αρχη και τα πρωτον των οντων, ακινητον και καθ' αυτο, και κατα συμβεβηκος· κινουν δε την πρωτην και αιδιον, και μιαν κινησιν. επειδε το κινουμενον αναγκη υπο τινος κινεισθαι, και το πρωτον κινουν ακινητον ειναι καθ' αυτο, και την αϊδιον κινησιν υπο αϊδιου κινεισθαι, και την μιαν υφ' ενος· ορωμεν δε παρα την του παντος την απλην φοραν, ην κινειν φαμεν την πρωτην ουσιαν, και ακινητον, αλλας φορας ουσας τας των πλανητων αϊδιους· αϊδιον γαρ και αστατον το κυκλω σωμα· δεδεικται εν τοις φυσικοις περι τουτων· αναγκη και τουτων εκαστην των φορων υπ' ακινητου τε κινεισθαι καθ' αστο, και αϊδιου ουσιας. ητε γαρ των αστρων φυσις, αϊδιος ουσια τις ουσα· και το κινουν αϊδιον, και προτερον του κινουντος· και το προτερον ουσιας, ουσιαν αναγκη ειναι. φανερον τοινυν, οτι τοσαυτας ουσιας αναγκαιον ειναι, την τε φυσιν αϊδιους και ακινητους καθ' αυτας, και ανευ μεγεθους, δια την ειρημενην αιτιαν προτερον.

troduced for the purpose of persuading the multitude, enforcing the laws, and benefitting human life. For they ascribe to THE FIRST ESSENCES *a human form, and speak of them as resembling other animals, and assert other things consequent and similar to these.* BUT IF AMONG THESE ASSERTIONS ANY ONE SEPARATING THE REST RETAINS ONLY THE FIRST, VIZ. THAT THEY CONSIDERED THE FIRST ESSENCES TO BE GODS, HE WILL THINK IT TO BE DIVINELY SAID: AND IT MAY BE PROBABLY INFERRED, THAT AS EVERY ART AND PHILOSOPHY HAS BEEN INVENTED AS OFTEN AS POSSIBLE, AND HAS AGAIN PERISHED, THESE OPINIONS ALSO OF THE ANTIENTS HAVE BEEN PRESERVED AS RELICS TO THE PRESENT TIME. *Of the opinions of our fathers, therefore, and men of the highest antiquity, thus much only is manifest to us*[6]." To these first essences also, he alludes in the following beautiful passage in the second book: " *As are the eyes of bats to the light of day, so is the intellect of our soul to such things as are naturally the most splendid of all.* So prevalent, indeed, was this doctrine among the antients, that even so late as the time of the Emperor Commodus, the elegant

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[6] Παραδεδοται δε ὑπο των αρχαιων και παλαιων, εν μυθου σχηματι καταλελειμμενα τοις ὑστερον, ὁτι θεοι τε εισιν ὁυτοι, και περιεχει το θειον την ὁλην φυσιν. τα δε λοιπα μυθικως ηδη προσηχθη προς την πειθω των πολλων, και προς την εις τους νομους και το συμφερον χρησιν. ανθρωποειδεις τε γαρ τουτους και των αλλων ζωων ὁμοιους τισι λεγουσι, και τουτοις ἑτερα ακολουθα και παραπλησια τοις ειρημενοις· ὡν ει τις χωρισας αυτο λαϐοι μονον το πρωτον, ὁτι θεους ῳοντο τας πρωτας ουσιας ειναι, θε ιωςαν ειρησθαι νομισειε· και κατα το εικος πολλακις ευρημενης εις το δυνατον εκαστης και τεχνης και φιλοσοφιας, ναι παλιν φθειρομενων, και ταυτας τας δοξας εκεινων, ὁιον λειψανα περισεσωσθαι μεχρι του νυν'. ἡ μεν ουν πατριος δοξα, και ἡ παρα των πρωτων, επι τοσουτον ἡμιν φανερα μονον. Dr. Gillies's translation or analysis, or by whatever other name he may think fit to call it, of this passage is as follows: "This doctrine (viz. concerning a first incorporeal mover) was delivered down from the ancients, and remains with their posterity, in the form of a fable; which, with many additions to it, has been employed for the service of legislation, and for bridling the passions of the multitude. The gods have thence been represented as endowed with human forms, and agitated by human passions; from which strange suppositions, many consequences not less strange have very naturally been derived. Yet, from the motley mass of fiction if we separate this single proposition, *that deity is the first of substances*, it will appear to be divinely said; and to have been saved as a precious remnant, in the wreck of arts and philosoply, which it is probable have often flourished, and often fallen to decay." Analysis of Aristotle's works, p. 136. The gross ignorance, or wilful perversion, of Aristotle's meaning, displayed in this pretended translation by Dr. Gillies, must be obvious to every one.

Maximus Tyrius observes, "That there is in all the earth one according law and opinion, that there is one God, the king and father of all things, and many gods, sons of God, ruling in conjunction with him. This is asserted by the Greek and the Barbarian, by the inhabitant of the continent, and by him who dwells near the sea, by the wise, and by the unwise. And if you proceed even as far as to the utmost shores of the Ocean, there also there are gods, rising very near to some, and setting very near to others [7]."

If indeed the doctrine of Polytheism consisted in admitting that there is a multitude of principles equal in dignity and power to the great and ineffable principle of things, the censure which has been repeatedly passed on this doctrine, with so much zeal, by modern theologists, would be highly just, since it is an hypothesis no less false in its principles than dire in its consequences. This, however, was far from being true of the polytheism of the ancient world, as is largely shown by Dr. Cudworth in his Intellectual System, and must be obvious to every one who reads with attention the remains of Grecian and Roman literature. But, on the other hand, to censure the doctrine, that producing causes of things subsist concentered and rooted in one first producing cause, but with due subordination to their comprehending principle, is to oppose one of the most sublime conceptions of the human mind, endeavour to subvert the heaven-built fabric of intellectual philosophy, and in mythological language, to war on the Olympian gods.

To such, indeed, as have not regularly studied the scientific writings of Plato and Aristotle, it will doubtless in the first place seem absurd to introduce a multitude of principles in order to the production of the universe. To these, one principle appears sufficient for the purpose; and the hypothesis of a multitude subsisting in conjunction, and co-operating, with him, is considered as useless, and as tending to diminish the power and sully the dignity of the parent of things. They will likewise deem it impossible to conceive how a multitude of principles can have a distinct energy of their own, at the same time that they are comprehended in, and energise together with, a higher cause.

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[7] Ἑνα ιδοις αν εν πασα γῃ ὁμοφωνον νομον και λογον, ὁτι θεος ἑις παντων βασιλευς και πατηρ, και θεοι πολλοι, θεοῦ παιδες, συναρχοντες θεῳ· ταυτα δε ὁ Ἑλλην λεγει, και ὁ βαρϐαρος λεγει, και ὁ ηπειρωτης, και ὁ θαλαττιος και ὁ σοφος, και ὁ ασοφος· κᾀν επι του ωκεανου ελθῃς τας ηϊονας, κᾀκει θεοι, τοις μεν ανισχοντες αγχου μαλα, τοι δε, καταδυομενοι.

The first of these objections may be easily removed, by considering that the most perfect mode of production is the *essential*, or, in other words, when a being produces by its very nature or essence. Instances of this *essential* mode of production are seen in fire and snow, the former *essentially* imparting heat, and the latter cold. This mode is more perfect than that which is attended with *deliberation*, because more extended. Thus, all such beings as produce *deliberatively*, as is the case with rational souls like ours, are at the same time connected with the *essential operation;* such as is the energy of nature in generation, nutrition, and increase. But the energy of nature is present with beings to whom the power of deliberation is unknown. And hence the *essential* is more extended than the *deliberative* energy. The essential energy, therefore, must be the prerogative of the highest producing cause, because more powerful than the deliberative: for superiority of power is always the characteristic of a superior cause.

If, therefore, the great principle of things operated from his very nature in producing all things, and this without the conjunction of subordinate causes, and if he is *the one itself* (since nothing is more excellent than unity,) all things would have been profoundly one, without any apparent distinction and separation: for, in productions of this kind, the effect is always *secondarily* what the cause is according to a *primary* mode of subsistence. The existence, therefore, of the corporeal world necessarily proves the existence of lesser producing causes co-operate with the *one* father of all in the production of things.

The second objection, respecting the distinct energy of subordinate causes, or principles, may be removed by diligently attending to the different powers of the human soul. For in these powers, as images, we shall conspicuously see, how a multitude of divine natures may possess a distinct energy of their own, at the same time that they are comprehended in, and energise together with, a superior nature. If we survey, then, the *gnostic powers* of the soul, we shall find that they are accurately five in number, viz. *intellect, the dianoëtic power, opinion, phantasy, and sense.*

Intellect is that power by the light of which we understand simple self-evident truths called axioms, and are able to pass into contact with intellectual forms separated from all connection with matter.

By *the dianoëtic power* we reason scientifically,

Opinion is that which knows the universal in sensible particulars, as that every man is a biped; and the conclusion of the dianoëtic power, as that every rational soul is immortal; but it only knows the οτι, or *that* a thing is, but is perfectly ignorant of the διοτι, or *why* it is.

The *phantasy* is that power which apprehends things clothed with figure, and may be called a *figured intelligence* (μορφωτικη νοησις)

Lastly, *sense* is that power which is distributed about the organs of sensation, which is mingled with passion in its judgment of things, and alone apprehends that by which it is externally agitated.

Now, it is evident, since the energies of these powers are perfectly distinct from each other, that the powers themselves, which are the sources of these energies, must also be distinct.

Again, it is evident that *desire*, which tends to one thing, *anger*, which aspires after another thing, and that *deliberate tendency to things in our power*, which the Greeks call *proairesis* (προαιρεσις) are so many distinct vital powers of the soul. But above both the gnostic and vital powers is *the one*, or the summit of the soul, by means of which we are enabled to say, I perceive—I opine—I reason—I desire—I deliberate—which summit follows all these energies, and energises together with them; for we should not be able to know all these, and to apprehend in what they differ from each other, unless we contained a certain indivisible nature, which subsists above the common sense, and which, prior to opinion, desire, and will, knows all that these know and desire, according to an indivisible mode of apprehension.

It must, however, be carefully observed, with respect to those mighty powers which subsist in unproceeding union in the ineffable principle of things, that, as their union with this principle is infinitely more transcendent, their characteristic properties are likewise infinitely more distinct from each other, and from the one cause of all, than the union and distinction between the human soul and its different powers. For the subsistence of the former is that of effects in their exempt cause; but in the latter case, the powers of the soul are consubsistent with the soul, and the soul could not exist without them. As we therefore and all other animals have a subsistence distinct from the first cause, though we are rooted in him, this is much more the case with those mighty powers that are the immediate progeny of this cause. Hence those theologists who have not been able to see this distinction between the first cause, and his divine offspring, have considered this offspring to be nothing more than his attributes.

But as this is a subject of all others the most important, it is requisite to be more explicit. If then it is necessary that the progression of beings should be continued, and that no vacuum should intervene either in incorporeal natures, or in bodies themselves, it is also necessary that every thing which has a natural progression should proceed through similitude; since it is by no means lawful that the thing caused should be the same with its cause: for, if that which is second were the same with that which is first, each would be similarly the same, and one would not be the cause, and the other the thing caused. But if they are alone different, they can never be conjoined with each other, nor can the one participate of the other: for conjunction and participation are a communion and sympathy of participants, and the natures they participate. And if they are at the same time both *same* and *different*: since in this case there is identity, defect, and something which is vanquished by a power contrary to sameness; *the one itself* will no longer be the principle of the progression of beings, nor will every generative cause have a subsistence in the order of *the good* prior to secondary causes; for *the one* is not the cause of division, but of friendship; and *the good* converts generated natures to their causes. But the conversion and friendship of secondary towards prior natures subsist through similitude, and not through a dissimilar nature. If, therefore, *the one* is the cause of the universality of things, and if *the good* is the object of vehement desire to all things, it will every where constitute through similitude the progeny of antecedent causes; so that the progression of things will subsist according to *the one*, and the conversion of these progressions will be directed to *the good*. For neither is conversion without similitude, nor can the generation of effects which return to their kindred principles ever subsist without this.

But that which immediately follows, and is demonstrated from this, is, that it is necessary every monad should produce a number of the same order with itself, viz, *Nature*, a natural number, *Soul*, one that is psychical and *Intellect*, an intellectual number. For, if whatever possesses a power of generating generates similars prior to dissimilars, as we have already demonstrated, hence every cause must deliver its own form and property to it sprogeny; and before it generates that which gives subsistence to progressions far distant and separate from its nature, it must constitute things proximate to itself according to essence, and conjoined with it through similitude. Every monad, therefore, constitutes a multitude, indeed, as generating something posterior to itself, and dividing the powers which had a prior occult subsistence in itself. For things which subsisted uniformly and conjointly in the monad, appear separately in the progeny of the monad. And the truth of this, indeed, *universal Nature* herself declares, comprehending in one the productive principles of all things contained in the heavens and in the sublunary regions; but distributing her own powers to the natures which, proceeding from her monad, are divided about the fluctuating empire of bodies. For the *natures* of fire, earth, and the moon, possess their properties and forms from *universal nature*, with which they energise, and contain its peculiar distributions. But this also the monad of mathematics and numbers evinces: for, since this is primarily all things, and since it spermatically constitutes the forms of numbers in itself, it distributes different powers to numbers externally pro-

ceeding

ceeding from its nature. For it is impossible that a generated nature should at once receive the whole abundance of its generating cause: and it is necessary that the cause of all things, having a prior subsistence, should appear as a prolific power. Multitude, therefore, subsists about the monad, and number, distributing the properties which abide collectively in the monad. Because, therefore, as we have before observed, that which is similar is more conjoined with its cause than that which is dissimilar; hence one progression will be a multitude similar to the monad from which it proceeds; but the other will be a multitude of dissimilars. But the multitude which is similar to the monad will be that in a divided manner which the monad is indivisibly. For, if the monad possesses power, and a peculiar hyparxis[a], the multitude proceeding from it will likewise contain the same form of hyparxis, with a remission as to the whole.

But after this it is necessary to consider in the third place, that, of progressions, such as are nearer to their cause are indicative of a greater multitude of things, and are at the same time in a certain respect equal to their containing causes; but that such as are more remote possess a less extended power of signification; and, on account of the diminution of their power, change and diminish at the same time the amplitude of production. For if, of progressions, that which subsists the first in order is more similar to its principle, and that which gives subsistence to the greatest number is both with respect to essence and power more similar to the generating principle of all things, it is necessary that, of secondary natures, such as are nearer to the monad, and which receive dominion after it, should give a greater extent to their productions; but that such things as are more separated from their primary monad should neither pervade in a similar manner through all things, nor extend their efficacious energies to far distant progressions. And again, as similar to this, it is necessary that the nature which gives subsistence to the greatest number of effects should be placed next to the monad, its principle; and that the nature generative of the most numerous progeny, because it is more similar to the supplying cause of all things than that which is generative of a few, must be placed nearer to the monad, according to hyparxis. For, if it is more remote, it will be more dissimilar to the first principle; but, if it is more dissimilar, it will neither possess a power comprehending the power of similar natures, nor an energy abundantly prolific. For an abundant cause is allied to the cause of all. And universally, that which is generative of a more abundant, is more naturally allied to its principle than that which is productive of a less numerous progeny. For a defect of power is effective of fewer productions: but a subjection of essence is a defect of power; and a subjection of essence becomes redundant, on account of dissimilitude with its cause, and distance from its principle.

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[a] Hyparxis signifies in any being, the summit, or as it were flower, of its nature.

Again, therefore, in addition to what we have previously demonstrated, we shall assert that which possesses the most indubitable truth; I mean, that it is requisite, prior to the causes which are participated, that imparticipable[9] causes should every where have a prior subsistence in the universality of things. For, if it is requisite that a cause should have the same relation to its progeny as *the one* to the universal nature of beings, and that it should naturally possess this order towards things secondary; and if *the one* is imparticipable, as being equally exempt from all beings, and as that which is productive of all things uniformly;—in consequence of this, it is necessary that every other cause which imitates the excellency of *the one* in all things should be exempt from the beings subsisting in secondary ranks, and from the natures participated by them. And again, it is requisite that every imparticipable and primary cause which is similar to *the one*, should establish monads of secondary natures similar to itself prior to such as are dissimilar. I say, for instance, it is requisite that one soul should distribute many souls to different natures; and one intellect participated intellects to many souls. For thus every first exempt genus among the divine orders will be universally distributed analogous to *the one.* And secondary natures which participate kindred causes will be analogous to these exempt genera; and, through the similitude of their kindred causes, will be conjoined with their imparticipable principle. Hence, prior to the forms subsisting in other natures, those are established which subsist in themselves; and prior to composite causes such as are exempt; and imparticipable monads prior to such as are participable. And consequently (as that which is demonstrated at the same time with this) the exempt causes are generative of such as are composite, and imparticipable natures extend participable monads to their progeny. And natures which subsist in themselves produce the powers which are resident in other natures.

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[9] One thing is said to be imparticipable with respect to another, to which it is superior, when it is not consubsistent with it.

It is, therefore, necessary from the preceding axioms, since there is one unity, the principle of the universe, from which every hyparxis derives its hypostasis, that this unity should produce from itself, prior to every thing else, a multitude of natures characterised by unity, and a number the most of all things allied to its cause.

For, if every other cause establishes a progeny similar to itself, prior to that which is dissimilar; much more must *the one*, since it is superior to similitude, and is *the one itself*, produce according to union its first progeny. For how can *the one* establish its processions, except in a manner characterised by unity? For nature generates things posterior to itself naturally, soul psychically, and intellect intellectually. *The one*, therefore, is through union the cause of the universality of things: and the progression from *the one* is uniform. But if *the one* is that which first produces all things, and the progression is characterised by unity, it is requisite that the multitude produced from thence should be *self-perfect unities*, the most allied of all things to their producing cause. Besides, if every monad establishes a number allied to itself, as we have previously demonstrated, by a much greater priority must *the one* itself produce a number of this kind. For, in the progression of things, that which is produced is often dissimilar to that which produces, through the over-ruling sway of diversity: and such are the last of beings, and those which are far distant from their principles. But the first number, and that which coheres to *the one*, is uniform, ineffable, and superessential, and is entirely similar to its cause. For, neither can diversity happening to first causes separate generated natures from their generating cause, and transfer them into another order; nor can a motion of the cause, producing a subjection of power into dissimilitude and infinity, produce the generation of the universality of things; but the cause of all, excelling all motion and division, according to the characteristic of unity, establishes about itself a divine number, and conjoins it with its own simplicity. *The one*, therefore, prior to beings establishes the unities of beings.

For, again, according to another mode of speculation, it is necessary that such things as are first should participate the first cause through their proximate unities: for all secondary natures are conjoined with their antecedents through similars. Thus, bodies through particular souls are conjoined with universal soul; souls with universal intellect, through intellectual monads; and first beings with *the one itself*, through uniform hyparxes. For *being itself*, according to its own nature, is dissimilar to *the one*. For essence, because indigent of an unity externally assumed in order to accomplish the first union, cannot of itself be conjoined with that which is superessential, and is far distant from its nature. But the unities of beings which subsist from the imparticipable and exempt unity are able to conjoin beings with *the one itself*, and convert them to their own superessential natures. And Parmenides, demonstrating this in his second hypothesis, connects *the one* with *being*, contemplates all things about *the one*, and demonstrates that this nature, which proceeds and finishes its progression with the last of things, is the *one itself*. For it is necessary that the unities should be established prior to true beings themselves; since, as Timæus observes, it is not lawful for him who is the first, to produce any thing except that which is the most beautiful of all. But this is the most similar to that which is singularly the best.

But a multitude characterised by unity is the most similar to *the one*. For the Demiurgus of the universe, because he is good, constituted all things similar to himself. Much more, therefore, must the fountain of universal good produce and establish in beings *goodnesses* naturally conjoined with himself. There is, therefore, one god, and many gods; one unity, and many unities, prior to beings themselves; and one goodness, and many posterior to the first goodness, through which that beneficent intellect the Demiurgus, and every intellect, is divine, whether it is an intellectual or intelligible intellect. And that which is the first superessential is *the one*; after which many superessentials subsist. Whether, then, is this multitude of unities imparticipable, as *the one itself*, or is it participated by beings, so that the unity of every being is as the flower, summit, and centre of that being about which it subsists? But if these unities are imparticipable, in what respect do they differ from *the one*? For each of these unities is one, and has the first subsistence after *the one*. Or how, since they are exuberances of the first cause, were they constituted by it? For it is every where necessary that the nature which is second should be subject to that which is prior to itself, should fall off from its union, and on account of some addition should diminish the monadic simplicity of that which is first. What addition, therefore, or redundancy can we assert in addition to *the one*, if each of these unities is an unity by itself? For, if every unity is both one and many, we shall appear to transfer the property of being to the unities themselves. But if it is one only, in the same manner as that which is one itself, why does this latter possess a cause exempt from all other causes, while each of the unities is allotted a secondary dignity? On this hypothesis, therefore, we shall neither preserve the supremacy of the first cause over posterior natures, nor establish the progression of the unities from the first, unconfused either with respect to themselves, or the one principle of their subsistence.

But neither shall we believe in Parmenides[1], producing *the one* together with being, and demonstrating that there are as many parts of *the one*

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[1] See my translation of that Dialogue.

one as of being, and that every being participates of *the one:* that *the one* subsists every where together with being; and, lastly, that *the one* of the second hypothesis participates of, and is participated by, being; the mode of participation not being the same in either: for this one participates of being, as that which is not the first one, nor exempt from being; but as illuminating true-subsisting essence. But being participates of *the one,* as contained by *the one,* as replenished with divine union, and as returning to that which is *the one itself,* and imparticipable; for the unities which are participated conjoin beings with *the one* which is exempt from the universality of things; in the same manner as participated intellects unite souls with universal intellect, and participated souls conjoin bodies with universal soul. For it is not possible that the dissimilar genera of secondary natures should be immediately united with that cause which is exempt from all possible multitude. But it is necessary that this conjunction should take place through similar natures: for a similar multitude, so far as it is multitude, participates of that which is dissimilar: but, so far as it is similar to the monad prior to itself, so far it is conjoined with this monad. This similar multitude, therefore, being established in the midst of similitude, and multitude, becomes united with the whole, and with *the one,* which is prior to all multitude; but contains in itself far-distant progressions, and such as are dissimilar to *the one* of its own nature. And through this *one* all things return to this similar multitude, and extend themselves towards the first cause of the universe; dissimilars indeed through similar natures, but similars through themselves. For similitude essentially collects and conjoins many things in one, and converts second natures to the monads which are prior to themselves: for the very subsistence of similitude proceeds from *the one.* Multitude, therefore, is conjoined with *the one,* from which it derives its progression: and hence, similitude is that which causes many things to be allied and sympathize with each other, and to subsist in friendship among themselves and with *the one.*

No objections of any weight, no arguments but such as are sophistical, can be urged against this sublime theory, which is so congenial to the unperverted conceptions of the human mind, that it can only be treated with ridicule and contempt in degraded, barren, and barbarous ages. It is this theory, which those who declaim against the theology of the ancients should first endeavour to understand before they attempt to subvert. At the same time, unfortunately, it is a theory which has been so entirely neglected, that it is not to be discovered in any writing since the time of the Emperor Justinian. Indolence and priestcraft have hitherto conspired to defame those inestimable works[a], in which this and many other sublime and important theories can alone be found; and the theology of the Greeks has been attacked with all the insane fury of ecclesiastical zeal, and all the imbecil flashes of mistaken wit, by men whose conceptions on the subject, like those of a man between sleeping and waking, have been *turbid* and *wild*, *phantastic* and *confused*, *preposterous* and *vain*.

We find, however, from the above passage (which is certainly of inestimable value), that the doctrine that first essences are gods, is derived from men of great antiquity, and we have the testimony of Aristotle himself that it is a *divine doctrine*. He likewise very justly observes, that a human form and the forms of other animals were ascribed to the first essences, for the purpose of *persuading the multitude, enforcing the laws, and benefitting human life*. For, the multitude being merged in sense, can only by sensible images obtain a far-distant glimpse of incorporeal natures; and the whole of human nature is from its connection with body adapted to be led back through images to exemplars, and through sense to intellect. Hence, Aristotle very properly adds that human life was benefited by the fabulous part of the ancient theology. For, as Sallust, *On the Gods and the World*, beautifully observes, " Since the providence of the gods is every where extended, a certain habitude or fitness is all that is requisite in order to receive their beneficient communications. But all habitude is produced through imitation and similitude. Hence, *temples* imitate the heavens, but *altars* the earth; ***statues*** resemble life, and on this account they are similar to animals; and ***prayers*** imitate that which is intellectual; but *characters* superior ineffable powers; ***herbs and stones*** resemble matter, and animals which are sacrificed, the irrational life of our souls. But from all these, nothing happens to the gods beyond what they already possess; for, what accession can be made to a divine nature? But a conjunction with our souls and the gods is by these means produced." And thus much for an elucidation of the principal physical and metaphysical dogmas of the philosophy of Aristotle.

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[a] Those of the latter Platonists, viz. Plotinus, Porphyry, Jamblichus, Proclus, Ammonius, Olympiodorus, &c.

A

DISSERTATION

ON THE

PHILOSOPHY OF ARISTOTLE.

BOOK III.

CHAPTER I.

HAVING, therefore, amply elucidated the principal dogmas of the philosophy of Aristotle, from ancient and genuine sources, a more arduous undertaking remains for me to accomplish,—an undertaking no less singular than difficult, and which modern wit will at least deem unnecessary, if not even ridiculous. It is in short, to show, in the first place from the clearest evidence, that the writings of Aristotle have never been properly studied, and consequently that his philosophy has not been genuinely understood, since the destruction of the schools of the philosophers; and, in the second place, that other theories have, with no less arrogance than ignorance, been substituted for this philosophy,—theories for the most part false in their conclusions, and always erroneous in their principles, which originated from lawless ambition, look to nothing but what contributes to relieve the necessities, procure the conveniences, and administer to the pleasures of the merely animal life, and end in puerile amusement, idle conjecture, and profound scepticism.

> Νυν αυτη σκοπον αλλον, ον ουπω τις βαλεν ανηρ,
> Εισομαι αι κε τυχοιμι, πορη δε μοι ευχος ΑΠΟΛΛΩΝ.—Hom. Odyss.
>
> Now at a mark ne'er yet attain'd I aim,
> Apollo aid, and crown th' attempt with fame.

That from the destruction of Greece then, and the fall of the Roman Empire, barbarism succeeded to literature, and the ghastly and deformed image to the invigorating and beautiful form of Philosophy herself, is evident to those who are at all conversant with the history of the period that commenced after the reign of Justinian. What else indeed than the barbarous and Cimmerian darkness of ignorance, could be expected from the abolition of the schools of the philosophers? For Philosophy thus expelled from her native and genuine abode, and finding no place on the earth fitted for her reception, and adapted to the diffusion of her divine and salutary light, fled indignantly from the spreading darkness to heaven, whence she originally came, and from which she has not since that period descended. But who can sufficiently describe the folly and ignorance that immediately succeeded her flight? Who can paint the deformity of the figure that usurped her place on the earth; of the mitred ghost that, in monkish array, and with tyrannic hand, confined reason in a cloyster, compelled her to utter nothing but barbarous jargon, and fettered her sacred feet with ecclesiastical bonds?

To this dreadful ignorance also of genuine philosophy, the barbarous versions of the writings of Aristotle, and separating the study of them from those of Plato, did not a little contribute. Of the truth of the former of these assertions, the following history will afford abundant conviction, and that of the latter will be obvious to every legitimate student of the philosophy of Aristotle, as his works are introductory to those of Plato, and were always considered in this light by the best of his disciples.

The Arabians then, in the beginning of Mahometanism, (as we are informed by Abulpharagius [1],) scarcely applied themselves to any study besides that of cultivating their own language, and understanding their own law, except medicine, which though known to a few, was approved of by the many, because it was of universal advantage to mankind; but this was all empirical till they came to be acquainted with the Greek authors. This was the state of learning under the *Omniades*, who had reigned for about 91 years; but when God had raised the race of *Abbas* to the throne, in 754, they were roused a little from their sloth, and awakened out of that stupid way in which they had long indulged themselves. The first who showed any regard to the sciences was Almanzor, who not only had a great knowledge of the law, but applied himself to the study of natural philosophy, and particularly to astronomy. But the seventh chaliph of that line, Almamon, perfected what his progenitor Almanzor had begun, and endeavouring to procure the works of the learned from their proper places, he interceded and prevailed with the Grecian emperors to send him all the books on philosophy in their possession; and procuring the best interpreters he was able, he ordered all those books to be translated, and gave all possible encouragement for others to read and study them; insomuch that he would often be delighted with hearing the lectures and disputations himself; so zealous was he to improve natural knowledge, and the powers of the rational faculty, and would not content himself with the study of the mechanical arts, as did the Chinese and the Turks. He ordered instruments to be made for the purpose of taking observations of the stars; which the astronomers did in the province of Bagdad, and in mount Casius near Damascus. Several of these astronomers wrote on these subjects, particularly Alfraganius, the author of an introduction to astronomy, which comprehended all the rules laid down by

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[1] See Friend's History of Physic. vol. ii. p. 15.

Ptolemey, in very good language, and with a very clear explanation. So little did the Mahometan religion encourage ignorance, or forbid the use of letters at that time, as it does now.

Notwithstanding this progress, however, in learning, which we see was entirely derived from the Greeks, it does not appear that the Greek language was well understood till the time of Honain, in the reign of Almamon, about the year 840. Honain was a christian, born at Hira; and being rudely treated by Mesue the Syrian, who was an eminent physician, left Bagdad and retired into the Grecian territories, where he staid two years, till he was an entire master of the Greek language, and had made a great collection of all the philosophical books he could meet with; and then he returned to Bagdad, and after a little stay there went into Persia, where at Basora he learnt the Arabic tongue in great perfection. After this he came and settled at Bagdad, in high reputation, being well skilled in both languages, and chiefly employed himself in translating the writings of the Greeks, and among the rest the seven books of Paulus, the last of the ancient Greek writers on medicine. He was besides well skilled in the Syriac, and made many translations, particularly of medical books, in that language. He was by eminence on this account called the interpreter; and was reckoned to excel as much in this way, as the famous Sergius, so greatly commended by Agathias, in the time of Justinian. Abi-Osbaia relates, that Almamon saw in a dream an old man, who called himself Aristotle; upon waking he asked who Aristotle was; they told him he was one of the most celebrated philosophers among the Greeks; on which he desired Honain to translate his works into Arabic; and used to give him as much gold for every piece he translated as the book weighed. By the account of this author, Honain lived to a hundred years; for he was born A. H. 164, and died in 264. The same writer has a particular chapter, wherein he treats only of translators; and he enumerates forty-six who translated the Greek physicians into Arabic, but prefers Honain to all the rest, whose translations indeed continued in vogue ever after. His son Isaac and his nephew Hobaish applied themselves to the same studies, and it is to his family that we chiefly owe the Arabic versions of Hippocrates, Aristotle, Euclid, Ptolemey, and Galen.

These, however, and all the rest of the Arabic translations, were ill performed, and were of little use either in explaining or restoring the Greek text. Indeed, it may be confidently affirmed that the Arabians were so far from making great improvements in any science, that whatever they translated or imitated was rather made worse.

With respect, however, to what more immediately pertains to Aristotle, no one of the Arabians was so celebrated in Europe for an attachment to the philosophy of the Stagirite as Abenrached or Averroës; for the fame of this Arabian physician was very inconsiderable in the East; though in Europe he was called by way of eminence the commentator, and was preferred to all the other interpreters of Aristotle[a]. The most ancient edition of his commentaries, together with the context of Aristotle, which was at first made from Arabian, and was wonderfully interpolated from a collation with Hebrew copies, was at length obscured in a greater degree by the two Jews, Jacob Mantinus, and Abraham de Balmis, who in consequence of understanding Latin gave a new version of Aristotle, but from the Hebrew. Hence, this last edition was the worst of all, though it was frequently and magnificently reprinted at Venice. For whatever works of Aristotle were translated into Arabic, were not translated from a latin copy, but first from Greek into Syriac, and then from each of these tongues into Arabic. But Joannes Vives, in the fifth book of his trèatise De causis corruptarum Artium, has truly and elegantly shown how great the inelegance and obscurity of that version of Aristotle is, which Averroës in his commentary has attempted to unfold. Hence, it is evident that the schoolmen, while they wished to appear to be the disciples of Aristotle, by no means read to their pupils the doctrine of their master. For though some of the commentaries of Themistius and Alexander Aphrodisiensis were translated into Arabic and Hebrew, yet the corruption was still greater of the copies and of the versions which were made of them. Hence, the scholastic doctors, no less than the Jewish philosophers, may be said to have rather acted the part of diviners in reading the books of Aristotle, than to have literally explained them. The truth of this will be immediately acknowledged by any one who compares a page of the Greek text of Aristotle with those interpretations which either the Latin edition of Averroës, or the commentaries of Thomas Aquinas, exhibit. For there is no one of these, or of all the rest, which has not suffered remarkable changes from the collation of different copies, some of which were altered conformably to a Greek, others to an Arabian or Syrian, and others to a Hebrew copy, so that at length it was no longer possible to ascertain what should be the true reading, but the censors of these versions adopted that reading only which appeared to them to be nearest the truth. This indeed is so frequently the case in the interpretations of Arabian books, that the philosophy of Avicenna, which was published in Latin at Venice, is so remote from the sense of the author, that he who reads it will know nothing of his real meaning; and consequently this must have happened in a much greater degree to the translations of Aristotle from the Arabic, in consequence of his profundity, and the studied obscurity of his diction.

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[a] See the Disquisition of Renaudotus de Barbaricis Aristotelis librorum versionibus in Fabric. Biblioth. Græc. Tom. 12, p. 246.

How much indeed the Arabians perverted or interpolated the Greek originals, instead of rendering the accurate meaning, sufficiently appears by the many tracts ascribed to Galen, which are pretended to be translated from the Arabic, and which are not extant in the Greek. This liberty which they took in translating, extended to all kinds of authors which came under their hands; and they altered, added, or suppressed at discretion. Their constant practice was the same even in Latin writers. We have the testimony of J. Leo in this particular, who blames the Arabians for receding from the Roman historians, when they pretend to translate them, and do not observe the order and series of facts, as they are laid down in the original, but only give the heads of them by way of an abridgement, and adapt every thing relating to the chronological part either to the Persian annals, or the era of the Hegira.

CHAPTER II.

With respect to the schoolmen, Thomas Aquinas is said to have been their founder; for having read Aristotle in a translation of Averroës made by a Spaniard, he derived from it the method which Lanfranc Archbishop of Canterbury, Gilbert Porretain Bishop of Poictiers, Abelard and Peter Lombard, had already adopted from Damascenus; and of which Peter Comestor composed the first elements. Danæus in his Prolegomena on the first of the sentences, has given an account of the beginning of the Scholastic philosophy, which may be said, like the school of Plato, to have had three different periods; the ancient, the middle, and the new. The first, which had its beginning under the Archbishop of Canterbury, or rather under Peter Lombard, lasted almost two hundred years, and ended under Albertus Magnus. Alexander Alesius was the most considerable of these first schoolmen. The second began with Albertus Magnus, Bishop of Ratisbonne, and continued till Durandus; and during that space of about a hundred years, the barbarized doctrine of Aristotle obtained its highest reputation, by the celebrity that was given to it by Thomas Aquinas, and Duns Scotus. The third age of school-philosophy began with Durandus, who to gain reputation rose against Thomas Aquinas, and lasted till the time of Gabriel Biel, a German. Then the schoolmen began to subtilize more and more, by an emulation of being Nominalists or Realists. Ocham was the chief of the Nominalists, who taught that beings universal are but words; and Scotus was the leader of the Realists, who taught that the same universal beings are realities; while in the mean time neither Ocham nor Scotus had any conception of the real existence of universals in the soul prior to those which are obtained by an abstraction from sensibles, though it evidently follows from the doctrine of Aristotle himself, that such universals have a subsistence, and that unless this is admitted there can be no such thing as demonstration or scientific knowledge. This, however, arose from the schoolmen adopting as an axiom *that there is nothing in intellect, which had not a prior subsistence in sense*[3]. So great was the animosity of these two sects, that the minds of men were hurried into extremities that cannot be paralleled in antiquity. As a proof of this, in Germany their hostility was such, as sometimes broke out into extravagancy and rage. It was no longer disputing in the universities, but fighting, and opinions were only defended by violence. Then it was that the ghost of philosophy incited men to employ themselves about nothing but idle conceptions and precisions, and that the wit was exhausted with frivolous questions. Men became enraged with each other for mere formalities and phantasms; arguments were wholly litigious; and the reasoning power was exercised for victory and not for truth.

That the reader may be more fully convinced of the truth of what is here asserted, the following extracts are given from the works of Albertus Magnus, one of the most celebrated of the Peripatetics in the dreadfully dark period that succeeded the destruction of the Greeks. For in these extracts the fraud of the Arabians, and the barbarous and polluted state in which philosophy was transmitted from them to the schoolmen, will be most indisputably evident.

In the first place then, Albertus in his treatise De natura & origine animæ[4], says, "De opinione autem Isaac Israëlitæ philosophi qui antiquissimos Epicureorum Hesiodum et Athalum et Cecinnam sequi videtur, cum aliis convenit, animam ponens immortalem," &c.—i. e. "With respect to the opinion of Isaac the Israelite philosopher, who seems to follow the most ancient of the Epicureans, Hesiod and

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[3] Nil est in intellectu quod non prius fuit in sensu.

[4] See his works, Tom. 5. cap. 11. p. 210.

Athalus, and Cecinna, he accords with the rest of the Epicureans[5]; for he admits that the soul is immortal." Here in the first place we see, that Hesiod is made to be one of the Epicureans, though he lived long before Epicurus. In the next place, there are no such philosophers upon record as Athalus and Cecinna. And, in the third place, it is asserted that the Epicureans admitted the immortality of the soul, though,

> "As all our youth may learn from Creech,"

it is well known that the mortality of the soul is one of their principal dogmas.

Again, speaking in cap. 14, of the contemplative felicity of the soul after death, he observes, "Et hanc felicitatem præ omnibus aliis Solon Atheniensis commendavit, dicens animam post mortem in his felicitari; propter quod cum in ultimo spiritu esset constitutus, et Metrodorus, et quidam alii coram eo conferrent de quodam intelligibili divino, supra vires collecto spiritu caput erexit: et cum a Metrodoro compatienti sibi rogaretur, caput ad cervical submittere, dixit: Sinite ut et hoc intelligibile de quo confertis, apprehendam antequam moriar, ut ampliori luce felicitatis elevetur intellectus."—i. e. "And this felicity Solon the Athenian commended beyond any other. Hence when he was at the point of death, and Metrodorus and certain others discoursed with him about a certain divine intelligible; Solon, having collected his spirit beyond his strength, raised his head; and when he was asked by Metrodorus who sympathised with him, to lay his head on the pillow, he said, suffer me before I die to understand this intelligible which is the subject of your discourse, that my intellect may be elevated to a more splendid degree of felicity." Now this is a most singular perversion of the following passage from Cicero On Old Age: "Gloriabatur Solon, se, aliquid quotidie addiscentem, senem fieri. Quod et supremo vitæ die confirmavit. Nam cum assidentes ei amici, quadam de re

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[5] That Albertus means by *cum aliis*, the rest of the Epicureans, is evident from a perusal of the whole chapter, and from the very title of it, which is De opinione Isaac, et Cecinnæ, et Athali, et aliorum Epicureorum philosophorum.

inter se sermonem conferrent; caput jam morte instante gravatum erexit: interrogatusque cur id fecisset? respondit: *Ut cum istud, quidquid est, de quo disputatis, percepero, æquiore animo moriar.*"—i. e. "Solon boasted that he grew old, daily learning something; which also he confirmed to the last day of his life. For when his friends sitting with him were discoursing with each other about a certain thing, he raised his head which was heavy with death that was now near at hand, and being asked why he did so, answered, *in order that when I shall have understood that which you are discussing, whatever it may be, I may die with greater equanimity.*" The reader I trust need not be admonished how much this passage is perverted and interpolated by Albertus, who doubtless derived it from an Arabian translation of Cicero, or at any rate from some Arabian author.

Again, in the 15th chapter of the same treatise, Albertus says, that Aristotle in his book On the Nature of the Gods, asserts of Socrates, "who among all mortals had the greatest communion with the immortal gods, that he became divine by collecting things of a divine nature in particulars," &c. "Propter quod Aristoteles in lib. De natura deorum dicit, quod Socrates, cui inter omnes mortales cum diis immortalibus maxima communio, factus est divinus, divina in singulis colligendo," &c. And he concludes his citation by observing, "that the contents of this chapter are what Socrates delivered concerning the immortality of the soul, as the philosopher Plotinus relates of him in a certain little treatise which he composed on the difference of the virtues, and in which he says that the wise man alone becomes divine, and proves that he cannot become the subject of perturbation." Et hæc quæ in capitulo continentur, sunt quæ de immortalitate animæ tradidit Socrates, sicut de ipso recitat Plotinus philosophus in quodam libello suo quem de differentiis virtutum composuit, & solum divinum factum sapientem esse dixit, et in hunc probavit non posse cadere perturbationem."

Here, in the first place, a treatise is ascribed to Aristotle which is neither extant, nor mentioned in any catalogue of his lost works; and in the next place an extract is given, as from Plotinus, but which is not to be found in his works, though all the books of that philosopher have come down to us, enumerated by his immediate disciple Porphyry. Among the writings of Plotinus there is indeed a book On the virtues, but nothing which Albertus cites is to be found in it, nor is Socrates once mentioned throughout the treatise.

The following also is a most curious specimen of Arabian fraud and interpolation. "Ptolemæus autem in libro de dispositione sphæræ qui est introductorius Almagesti, dicit sub utroque tropico, æstivo scilicet & hyemali habitare Æthiopes: & confirmat hoc per quendam poetam, qui dicitur nomine Krices; qui Krices inducit Homerum dicentem: et sunt hæc verba Ptolemæi: Natura quidem exigit duo genera Æthiopum, quorum unum est sub tropico æstivo, et sunt Æthiopes qui sequunter nos: et alterum genus Æthiopum est qui sunt sub tropico hyemali, qui est tropicus æstivus illis, quorum pedes sunt in directo pedum nostrorum. Et Krices quidem retulit de Homero versificatore, quod ipse dixit hos Æthiopes in versibus suis, cum dicit: Et virtus in duobus finibus duas habit divisiones, quarum una est in occasibus horizontis, et altera est apud elevationem." Tom. 5. p. 271. Here again, a book is ascribed to Ptolemy which he never wrote: a poet Krices is cited who was never heard of but by the Arabians, and yet Ptolemy is made to quote him; and in the last place, certain verses are fathered upon Homer, which he never composed.

Again, Albertus in his treatise De Causis et Processu Universitatis, (Oper. Tom. 5. cap. 3.) observes as follows: "Omnibus autem quæ contra Epicuros inducta sunt, quidam consentientes Stoicorum induxerunt philosophiam. Cujus philosophiæ licet princeps fuerit Socrates, tamen quia non nisi de moribus scripsit, et de inquisitione veritatis et philosophiæ nihil tractavit, ideo Platonis susceperunt tractatum, qui dicta Socratis compilavit, sicut ipse Plato in libro Phædonis testatus est." In this extract, Socrates is said to have been the leader of the Stoic philosophy, and Plato is made to assert in the Phædo what he does not assert, viz. that he compiled the sayings of Socrates. Poor Albert the Great, how grossly was he deluded by the fraud of Arabian impostors. And here, it will not be altogether foreign to observe, that from the confession of Albert himself, the treatise On Causes ascribed to Aristotle, was written by one David a Jew, who, says he, composed it from the sayings of Aristotle, Avicenna, Algazil, and Alpharabius, disposing them in the form of theorems after the manner of Euclid's Elements. And he adds, that David collected this book from a certain epistle of Aristotle On the principle of the universe[7]. There is not however the least probability that any part of this treatise is taken from any epistle or other lost work of Aristotle; as the whole is obviously a compilation from the Theological Elements of Proclus, barbarized by certain Arabian philosphers.

I shall finish my extracts from the works of Albertus with the following specimen from his commentaries on the Metaphysics of Aristotle. "Matter, says Aristotle, in the 8th chapter of the 9th book of his Metaphysics, is in capacity, because it may arrive at form. But when it is in energy then it is in form; and a similar reasoning takes place in other things, and of which the end is motion. Hence as teachers when they exhibit their disciple energizing, think that they have accomplished the end of teaching, this is also the case with nature. For if it were not so, a circumstance like the Hermes of Passo would take place; since it would be immanifest, whether science is internal or external, as was the case with his Hermes: for a work is the end, and energy is a work." *ετι η υλη εςι δυναμει, οτι ελθοι αν εις το ειδος. οταν δε γε ενεργεια ῃ, τοτε εν τῳ ειδει εςιν. ομοιως δε και επι των αλλων, και ων κινησις το τελος. διο ωσπερ οι διδασκοντες, ενεργουντα επιδειξαντες, οιονται το τελος αποδεδωκεναι, και η φυσις ομοιως. ει γαρ μη ουτω γιγνεται, ο Πασσωνος ερμης εςαι. αδηλος γαρ η επιςημη, ει εσω, ἢ εξω, ωσπερ κακεινος. το γαρ εργον τελος, η δε ενεργεια το εργον.* Now the history of Passo to which Aristotle in this passage alludes is, according to Alexander Aphrodisiensis, as follows: "The

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Accipiemus igitur ab antiquis quæcunque bene dicta sunt ab ipsis, quæ ante nos David Judæus quidam ex dictis Aristot. Avicen. Algazel. et Alpharab. congregavit, per modum theorematum ordinans ea, quorum commentum ipsemet adhibuit, sicut et Euclides in geometricis fecisse videtur. David autem, sicut ante jam diximus, hunc librum (De Causis) collegit ex quadam Aristotelis epistola quam de principio universi esse composuit, multa adjungens de dictis Avicinnæ et Alpharabii.

Albert. de Causis et processu unius. p. 568.

statuary Passo had represented in a certain stone the form of Mercury, and Mercury was seen in the stone; but whether it was within or without the stone was uncertain. It could not be said to be external to the stone, because if it were the stone must have been carved, and would have possessed inequalities; but the whole was as smooth as a minor. But neither could it be said to be within the stone. For if in the stone in which Mercury was represented, there had been any commissures or joinings, it might have been said that Mercury had been carved in another stone, and had been afterwards inclosed in very smooth stones placed upon it, and that these being pellucid, it could be seen through them; but as the stone was every way continuous and one, and had no joining, this could not be said to be the case. It was therefore uncertain, whether the Mercury was within or without the stone. It was dubious whether it was external, on account of the equality of the stone; and also whether it was internal, because it could not be conceived how within one continued stone Mercury could be fashioned." The following is the comment of Albertus on what Aristotle says about Passo, and is truly ridiculous, and the very acme of barbarism. "Si autem quis diceret hæc non esse vera, sed diceret potentiam esse finem sicut actum ultimum, et non distare potentiam discendi ab actu scientiæ acceptæ perdoctrinam, sequeretur inconveniens, quod Passiones qui fuit homo iners, et nihil sciens laudabilium, esset adeo perfectus sicut Mercurius, qui tantæ speculationis fuit, quod Deus putabatur esse scientiæ. Et hoc est inconveniens. Si enim Passiones est sicut Mercurius interius et exterius, et nihil finalis perfectionis habet Mercurius super Passionem, tunc scientia non est manifesta secundem actum speculationis Mercurii, sed est iners et rudis, sicut est Passiones."—i. e. "But if any one should say that these things are not true, but should say that capacity is an end in the same manner as the last energy, and that the capacity of learning does not differ from the energy of science received through learning, an absurdity would follow, because *Passiones*, who was an indolent man, and knew nothing that is worthy of praise, would be as perfect as Mercury, who made so great a proficiency in speculation, as to be thought to be the god of science. And this is absurd. For if Passiones is as Mercury both inwardly and outwardly, and Mercury has nothing of final perfection above Passiones, then science is not manifest according to the energy of the speculation of Mercury, but is sluggish and rude as Passiones was." It is somewhat strange, after these specimens of ignorance and barbarism in Albertus, to find John Picus of Mirandola assert, that in the writings of Albertus, there is something *ancient, ample, and grand; priscum, amplum, et grande.* Albertus was indeed a man of considerable genius, of admirable industry, and of great probity of manners, and it is much to be regretted that he lived in so barbarous a period, and that he knew nothing of Aristotle, but through the polluted channels of Arabian fraud.

CHAPTER III.

HAVING, therefore, shown by extracts from the works of Albertus Magnus, as a specimen, instar omnium, to what a great extent the writings of the Greek philosophers, and particularly those of Aristotle were perverted by the schoolmen, in consequence of their becoming acquainted with them through the medium of translations from the Arabic; I shall conclude my collection of instances of Arabian fraud, with those which I have discovered in the 14 books ascribed to Aristotle, De Secretiore Parte Divinæ Sapientiæ secundum Ægyptios, or *On the more secret part of divine wisdom according to the Egyptians.* This work is said to have been found at Damascus, and to have been translated from Greek into Arabic, and from Arabic into Latin, in the last of which languages it is extant in the editions of Aristotle's works by Casaubon and Du Vall. Fabricius justly conjectures that this work is supposititious; but neither he nor any other critic has demonstrated that it is so. From the following extracts, however, it will appear that it is in a great measure compiled from the works of Plotinus, though what is extracted from the writings of that philosopher is barbarized, as is usual with the Arabians; for this work, instead of being a translation

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first from Greek into Arabic, was doubtless originally an Arabian forgery. A few of these extracts, both from Plotinus and the Arabian treatise, I shall translate for the sake of the English reader, and refer the learned reader to the other passages of the languages in which they are extant.

In the first place, then, the following passage from cap. 4. lib. 1. appears to have been barbarized from the beginning of the 8th book of the 4th Ennead of Plotinus. "Ego sæpius animo contemplans, relicto corpore visus sum perfrui summo bono cum voluptate incredibili. Quare hæsi quodammodo attonitus, agnoscens me esse partem quandam superioris mundi, atque adeptum sentiens vitæ immortalitatem, sub luce maxima: quæ neque oratione exprimi potest, neque auribus percipi, neque cogitatione comprehendi. Tandem vero hac contemplatione defessus intellectus recidit in phantasiam, tuncque illa luce deficiente, factus sum tristior. Rursus relicto corpore, eo reversus deprehendi animum luce abundantem, huncque tum in corpus influentem, tum supra hoc excitatum.—Hæc igitur Plato."—i. e. "Frequently contemplating with my mind having left the body, I seem to enjoy the highest good with incredible pleasure.—Hence I have after a manner been fixed in astonishment, recognizing myself to be a certain part of the superior world, and perceiving that I have obtained immortality of life in the greatest light, which can neither be expressed by words, nor perceived by the ears, nor comprehended by thought. At length, however, intellect being wearied with this contemplation, falls back to the imagination, and then that light failing, I am rendered more sad. But again leaving the body and returning thither, I have perceived my intellect abounding with light, and this both when intellect is flowing into the body, and when it is raised above it." The words of Plotinus are as follow: *πολλακις εγειρομενος εις εμαυτον εκ του σωματος, και γινομενος των μεν αλλων εξω, εμαυτου δε εισω, θαυμαστον ηλικον ορων καλλος, και της κρειττονος μοιρας πιστευσας τοτε μαλιστα ειναι ζωην τε αριστην ενεργησας, και τῳ θειῳ εις ταυτον γεγενημενος, και εν αυτῳ ιδρυθεις εις ενεργειαν ελθων εκεινην, υπερ παν τε αλλο νοητον εμαυτον ιδρυσας, μετα ταυτην την εν τῳ θειῳ στασιν, εις λογισμον εκ νου καταβας, απορω πως ποτε και νυν καταβαινω, και οπως ποτε μοι ενδον η ψυχη γεγενηται του σωματος, τουτα*

ουσα οιον εφανη καθ' εαυτην, καιπερ ουσα εν σωματι.—i. e. "Frequently when excited from body to myself, and becoming external to other things, but within, or converted to, myself, I perceive a most admirable beauty, and believe myself to be a partaker of a more excellent allotment; for then especially I energize according to the best life, and becoming the same with divinity, and being firmly fixed in it, I arrive at an energy by which I establish myself above every other intelligible. But after this establishment in divinity, descending from intellect into the discursive energy of reason, I am dubious how formerly and now I descended, and how my soul became situated within the body, being such [i. e. so pure] as it appears to be in itself, though connected with body." The intelligent reader need not, I trust, be told that the former of these extracts is derived from the latter, nor how much the beautiful passage of Plotinus is deformed and barbarized by the Arabian plagiary.

Again, in the following extract, the Arabian author uses frequently the very words of Plotinus. The extract is from the latter part of the fifth chapter of the first book. "Plato igitur olim plura animo attribuit quæ nos ex ejus viva voce excepimus: sed ea non sunt ab illo literarum monumentis mandata: ex quibus alioqui facile lector hujus mentem deprehendisset. Ejusmodi autem attributa diversa sunt. Quoniam intellectus cum sensu conjungitur, nec in omnibus hunc despicit, sed conjunctionem cum corpore: a quo ligatus peneque extinctus detinetur. Animus enim in hoc, ut in loco est, sicut etiam Anticles arbitratur: sed amplius hoc addit, corpus illius esse carcerem. Ex quo etiam a Platone dictum est animum corpore solutum ascendere atque illustrari: eundem descendentem obscurari, sed postea purgatum rursum ascendere. Hujus autem descensus causæ sunt permultæ. Quarum prima in peccato est, scilicit pro eo pœnas det, nonnihilque promereatur, atque dei leges subeat. Alii ob aliam causam descendunt, quam ille non commemorat. Sed colligens animi descensum execratur: additque quoniam mundus hic substantiæ suæ præstantiam quandam habet et excellentiam, in eo animum extare oportere, devincto intellectu, quemadmodum in superiore mundo idem sempiternus habitur. Non enim rationi consentaneum ut mundus hic latissime patens et perfecte conformatus, intellectus sit expers. Neque vero hujus particeps esse potuit, nisi in eodem animus antecederet. Quare summus opifex animum cum illo conjunxit, et cum ea animi parte cujus est ratio, species permiscuit. Siquidem animi partes sine quadam dissensione inter se minime esse videntur. De quibus in plantis paucæ sunt, in belluis plures, in homine plurimæ. Ut iste mundus suam perfectionem habeat, quanquam ei quæ in superiore est, minime parem. Quia ab illo conformatus est, omnisque interitus originem continet. Quare mundo in sensum cadenti in esse oportet ea etiam animalium genera, quæ intelligibili insunt."—i. e. "Plato therefore formerly attributed many things to the soul, which we received from his own mouth; but they were not committed by him to writing; from which otherwise the reader might easily detect his meaning. The attributes, however, of a thing of this kind [i. e. of the soul] are different, because intellect is conjoined with sense. Nor does Plato entirely despise this union; but he despises the conjunction of the soul with the body, by which it is detained, bound, and almost extinguished. For the soul is in the body as in place[6], as also Anticles thought; but he likewise farther added, that the body is the prison of the soul. Whence also it is said by Plato, that the soul, when liberated from the body, ascends, and is illuminated; and that the same, when descending, is obscured; but that afterwards, when purified, it again ascends. But the causes of the descent of the soul are very many; of which the first consists in guilt, viz. that the soul may suffer punishment for it, be benefitted by punishment, and become subject to the laws of God. Other souls descend for a different cause, which Plato does not mention. In short, however, he execrates the descent of the soul; and adds, that because this world possesses essentially a certain excellence, it is necessary that soul should exist in it, intellect being bound, just as in the superior [i. e. the intelligible] world, intellect is eternal. For it is not conformable to reason, that this world which is so widely extended, and the conformation of which is so perfect, should be destitute of intellect. But neither can the world be a partaker of intellect, unless soul has an antecedent subsistence in it. Hence, the artificer of the universe conjoined soul with the world, and with the rational part of the soul mingled forms or ideas; since the parts of the soul are by no means seen to be without a certain disagreement among themselves. And of these forms, in plants there are but few, in brutes there are a greater number, and in man they are very numerous; in order that this world may have its own perfection, though this is very far from being equal to the perfection which is in the superior world; for this world derives its conformation from that, and contains in itself the origin of all destruction. Hence, in the sensible it is necessary there should be those genera of animals, which are in the intelligible world.

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[6] Here the memory of the Arabian plagiary failed him; for it is well known to be a dogma universally received by the Platonists, that the soul is not in the body as in place. For being incorporeal, it is impossible that it should be contained locally in the body.

The passage of Plotinus, from which the Arabian plagiary has evidently taken all this, is the following, and forms the latter part of the above cited chap. i. book viii. of the fourth Ennead, *On the descent of the soul into bodies.* λειπεται δε ημιν ο θειος πλατων, ος πολλα τε και καλα περι ψυχης ειπε. περι τε αφιξεως αυτης πολλαχη ειρηκεν εν τοις αυτου λογοις, ωστε ελπιδα ημιν ειναι λαβειν παρ᾽ αυτου σαφες τι. τι ουν λεγει ο φιλοσοφος αυτος; ου ταυτον λεγων πανταχη φαινεται, ινα αν τις εκ ραδιας το του ανδρος βουλημα ειδεν. αλλα το αισθητον παν πανταχου ατιμασας, και την προς το σωμα κοινωνιαν της ψυχης μεμψαμενος, εν δεσμῳ τε ειναι, και τεθαφθαι εν αυτῳ την ψυχην λεγει, και τον εν απορρητοις λεγομενον λογον μεγαν ειναι, ος εν φρουρᾳ την ψυχην φησιν ειναι. και το σπηλαιον αυτῳ ωσπερ εμπεδοκλει το αντρον, τοδε το παν δοκει μοι λεγουσιν, οπου γε λυσιν των δεσμων και ανοδον εκ του σπηλαιου τη ψυχη φησιν ειναι, την προς το νοητον πορειαν. εν δε φαιδρῳ πτερορρυησιν, αιτιαν της ενταυθα ᾽αφιξεως. και περιοδοι αυτην ανελθουσαν, παλιν φερουσι τηδε. και κρισεις δε καταπεμπουσιν αλλας ενταυθα, και κληροι, και τυχαι, και αναγκαι. και εν τουτοις απασι μεμψαμενος την της ψυχης αφιξιν προς σωμα. εν τιμαιῳ περι τουδε του παντος λεγων, τον τε κοσμον επαινει, και θεον λεγει ειναι ευδαιμονα. την τε ψυχην παρα αγαθου του δημιουργου προς το εννουν τοδε το παν ειναι δεδοσθαι. επειδη εννουν μεν αυτο εδει ειναι, ανευ δε ψυχης, ουχ οιον τε ειναι τουτο γενεσθαι. ητε ουν ψυχη η του παντος τουτου χαριν εις αυτο παρα του θεου επεμφθη. ητε εκαστου ημων, προς το τελεον αυτο ειναι. επειδε εδει οσον εν νοητῳ κοσμῳ, τα αυτα ταυτα γενη ζωων, και εν τῳ

αισθητῳ υπαρχειν.—i. e. "The divine Plato remains, who has said many and beautiful things about the soul, and has spoken in many parts of his works about its descent, so that we may hope to receive from them something perspicuous about it. What, therefore, does this philosopher say? It does not indeed appear that he every where says the same things on this subject, so as that any one may easily apprehend his meaning; but he every where despises the whole of a sensible nature, and blames the association of the soul with the body. He likewise asserts, that the soul is fettered and buried in the body, and considers what is said in the mysteries as a thing of great importance, viz. that the soul is in the present life as in a prison, secured by a guard. A cave, also, with him, in the same manner as with Empedocles, appears to me to signify this universe; and he says that a liberation from the bonds, and an ascent from the cave, is a progression to the intelligible. But in the Phædrus he says, that the defluxion of the wings of the soul is the cause of its descent hither. Certain periods, likewise, cause the soul, which has ascended again, to tend to the earth. Judgments, also, and allotments, and fortunes, and necessities, send other souls [into these lower regions]. And in all these places, he blames the descent of the soul into body. In the Timæus, however, speaking about this universe, he praises the world, and says that it is a blessed God; and that soul was imparted to the universe by the beneficent demiurgus, in order that the universe might be a partaker of intellect; since it is necessary that it should be intellectual, but it is not possible for it to become so without soul. The soul of the universe, therefore, was for this purpose imparted to the world, and also each of our souls, in order that the world might be perfect; since it is necessary that there should be as many, and the same genera of animals in the sensible, as there are in the intelligible world."

In the following passages, also, the plagiarism of the Arabian author is very apparent. In cap. 4, lib. 4, therefore, he observes: "Duplex mundus ita se habet, ut is qui solo intellectu percipitur altero in sensum cadente superior sit. Quoniam ille hujus causa est, et in eundem sua virtute influit. Quibus similitudine quadam respondent lapides duo:

de quibus unus summa arte exculptus est, alter rudis et informis. In iis enim unus altero perfectior non eo ipso quo lapis est (uterque enim lapis dicitur) sed quia ea forma ornatus cujus artificium non inerat materiæ: sed artificis mente prius comprehendebatur quam in lapide efformaretur. Artificium autem inest statuario, non quia oculatus est aut pedibus manibusve præditus, sed quia statuarius artis suæ peritus est per quam indicat quid faciendum. Eidemque formæ communes insunt: ipse vero formas singulas effingit hasque pulchras reddit. Quare ipsa ars in artifice nobilior est quam in opere. Neque forma secundum essentiam eadem in artifice est quæ postea in lapide: sed illa constans permanet, ab eaque artificis industria alia in materiam influit quæ alterius pulchritudinem assequuta non est, neque pro connatu artificis absoluta, sed pro materiæ capacitate."—i. e. "The twofold world [the intelligible and the sensible] subsists in such a manner, that the one, which is perceived by intellect alone, is superior to the other, which is the subject of sensible inspection. For the former is the cause of the latter, and flows into it by its power. And to these two worlds two stones will correspond by a certain similitude; with respect to which, one is carved with the most exquisite art, but the other is rude and unformed. For in these, one is more perfect than the other, not so far as it is a stone, (for each of them is called a stone), but because it is adorned with that form, the artifice of which was not inherent in the matter, but was comprehended in the mind of the artificer, prior to its being fashioned in the stone. But the artifice is inherent in the statuary, not because he is endued with eyes, or feet, or hands, but because he is skilled in his art, through which he indicates what is to be done. Common forms also are inherent in the statuary, but he fashions the several forms, and renders these beautiful. Art therefore in the artist is more noble than in the work. Nor is the form essentially the same in the artist, as that which is afterwards in the stone; but the former remains permanent, and by the industry of the artist another form flows into matter, which does not obtain the beauty of the other, nor has a perfection conformable to the endeavour of the artist, but adapted to the capacity of the matter."

The passage in Plotinus from which the above is obviously taken is the beginning of the eighth book of the fifth Ennead, and is as follows: πειραθωμεν ιδειν και ειπειν ημιν αυτοις, ως οιον τε τα τοιαυτα ειπειν, πως αν τις το καλλος του νου και του κοσμου εκεινου (i. e. νοητου) θεασαιτο. κειμενων τοινυν αλληλων εγγυς, εστω δε ει βουλει λιθων εν ογκῳ, του μεν αρυθμιστου και τεχνης αμοιρου, του δε ηδη τεχνη κεκρατημενου εις αγαλμα θεου, ἢ και τινος ανθρωπου. θεου μεν, χαριτος ἢ τινος μουσης: ανθρωπου δε, μη τινος, αλλ' ον εκ παντων καλων πεποιηκεν η τεχνη. φανειη μεν αν, ο υπο της τεχνης γεγενημενος εις ειδους καλλος, καλος ου παρα το ειναι λιθος. ην γαρ αν, και ο ετερος καλος ομοιως, αλλα παρα του ειδους, ο ενηκεν η τεχνη. τουτο μεν τοινυν το ειδος, ουκ ειχεν η υλη, αλλ' ην εν τῳ νοησαντι, και πριν ελθειν εις τον λιθον. ην δε εν τῳ δημιουργῳ, ου καθοσον οφθαλμοι ἢ χειρες ησαν αυτῳ, αλλ' οτι μετειχε της τεχνης. ην αρα εν τῃ τεχνῃ το καλλος τουτο, αμεινον πολλῳ. ου γαρ εκεινο ηλθεν εις τον λιθον το εν τῃ τεχνῃ, αλλ' εκεινο μεν μενει, αλλο δε απ' εκεινης ελαττον εκεινου. και ουδε τουτο εμεινε καθαρον εν αυτῳ, ουδε οιον εβουλετο, αλλ' οσον ειξεν ο λιθος τῃ τεχνῃ.—i. e. "Let us endeavour to perceive and narrate to ourselves, as far as it is possible to speak of such things, how the beauty of intellect and the intelligible world may be surveyed. Let it then be supposed that there are two stony masses placed near each other, the one being rude and destitute of art, but the other being now fashioned by art into the statue of some god or man. And if indeed it is the statue of a divinity, let it be that of one of the Graces or Muses; but if of a man, let it not be the statue of any individual, but that which art has made from an assemblage of all beautiful [human forms]. The stone, therefore, which has been fashioned by art into the beauty of form, will indeed appear to be beautiful, not because it is a stone; for if this were the case the other stone would be similarly beautiful; but its beauty will be derived from the form which was inserted into it by art. The matter, therefore, had not this form, but it was in the conception of the artist before it came into the stone. It was, however, in the artist, not so far as he had eyes and hands, but because he participated of art. This beauty, therefore, was in art much superior [to that which is in the statue]. For the beauty which was in art, did not proceed into the stone, but that indeed remained in the artist, and another beauty of an inferior kind was derived from it. Nor did even this remain pure in itself, or such as the artist wished it to be, but such as the stone was capable of receiving."

The following likewise are instances of obvious plagiarism in the

Arabian author. "Ponendum igitur pro exemplo id quod at intellectum pertinet. Ac ut auri portio quæ alterius rei significationem est habitura, si immunda sit repurgatur, vel omnino vel certe quodammodo; ut aurum vere sit, not extrinsicus tantum apparens, sed in interioribus etiam suæ substantiæ partibus, præditum omnibus auri qualitatibus, sic nobis nunc faciendum est dum essentiam primam per intellectum tanquam per imaginem explicare conamur."—Lib. 4, cap. 6.—i. e. "Let us, therefore, adduce as an example that which pertains to intellect. And as a portion of gold, which is to be indicative of some other thing, if it is impure must be purified, either entirely, or certainly partially, in order that it may be truly gold, not only externally appearing to be so, but likewise being endued with all the qualities of gold in the interior parts of its essence; this must now be done by us, while we endeavour to unfold the first essence through intellect as through an image." The words of Plotinus, from which the above passage is taken, are: *αλλα γαρ δει την εικονα εκ του γενεσθαι, ωστε μη δι εικονος, αλλ' οιον χρυσου παντος, χρυσον τινα δειγμα λαβειν. και ει μη καθαρος ειη ο ληφθεις, καθαιρειν αυτον, ἢ εργῳ ἢ λογῳ, δεικνυντας, ως ου παν τουτο εστι χρυσος, αλλα του τι το εν τῳ ογκῳ μονον.*—i. e. "For it is necessary that the image [of intellect] should be derived from intellect, so as that we may not speak of it through an image, but as if we received a certain piece of gold as a specimen of all gold. And if the portion which is received is not pure, it must be purified either in reality, or in words; demonstrating that this is not the whole of gold, but a certain portion of it only in bulk."—Ennead 5, lib. 8.

Again, immediately after the above passage, we have, in the Arabian author: "Sumendus enim est is intellectus qui perfectissime est repurgatus. Ad cujus cognitionem si quis aspirat ea in spiritibus est quærenda. Siquidem hi puri sunt et inexplicabilem habent venustatem: quoniam nihil nisi intellectus sunt.—Spirituum enim pulchritudo summa est. Quoniam sine ullo errore semper pureque intelligunt, resque cognoscunt, non ut humano labore inventas sed ut divina voluntate detectas."—i. e. "For that intellect must be assumed which is most perfectly purified; the knowledge of which must be sought for in spirits by him who aspires to obtain it. For these indeed are pure, and possess an ineffable beauty, because they are nothing but intellects. For the beauty of spirits is the highest beauty; because they always energise intellectually without error, and purely, and they know things not as discovered by human labour, but as unfolded by divine will." This is most obviously barbarized from the following passage of Plotinus in the above cited chapter: ουτω και ενταυϑα απο νου του εν ημιν κεκαθαρμενου. ει δε βουλει απο των ϑεων, οιος εστιν ο εν αυτοις νους. σεμνοι μεν γαρ παντες ϑεοι και το καλλος αυτων αμηχανον. ου γαρ δη ποτε μεν φρονουσιν, ποτε δε αφρονουσιν, αλλ' αει φρονουσιν εν απαθει τῳ νῳ και στασιμῳ και καθαρῳ: και ισασι παντα, και γινωσκουσιν, ου τα ανϑρωπινα, αλλα τα εαυτων τα θεια, και οσα νους ορα."—i. e. "Thus also here let us ascend from the now purified intellect which is in us. And if you are willing, let us begin from the gods, and consider what kind of intellect it is which is in them. For all the gods indeed are venerable and beautiful, and their beauty is immense. For they are not indeed at one time wise, and at another destitute of wisdom; but they are always wise, in an impassive, stable, and pure intellect; and they know all things, not merely such as are human, but their own concerns; viz. such as are divine, and such as intellect perceives."

The following passage from the Arabian is remarkable for its plagiarism, because it contains a dogma peculiar to Plotinus, viz. that something belonging to the soul perpetually remains in the intelligible world, even while the soul is connected with this terrestrial body. In the eighth chapter of the seventh book, therefore, the Arabian author observes: "Quod animus non omnino descendit in mundum inferiorem, nec is qui communis est, nec qui humanus: sed ejus aliquid supersit in mundo altero qui intelligibilis est, ab illoque minime translatus est, quia loco non indiget."—i. e. "The soul does not entirely descend into the inferior world, neither the soul which is common, nor that which is human; but something belonging to it always remains in the other world, which is intelligible, and is by no means transferred from that world, because it is not in want of a place." Compare this with the beginning of the last chapter of the eighth book of the fourth Ennead of Plotinus. και ει χρη παρα δόξαν των αλλων τολμησαι το φαινομενον λεγειν.

λεγειν σαφεστερον, ου πασα ουδ᾽ η ημετερα ψυχη εδυ, αλλ᾽ εστι τι αυτης εν τῳ νοητῳ αει.—i. e. "And if I may be bold enough to assert more clearly what appears to me to be the truth, contrary to the opinions of others, neither does the whole of our soul enter into the body, but there is something belonging to it which always remains in the intelligible world."

In the following passage, also, the plagiarism is remarkably obvious: "Quandoquidem quæ in eo sunt [i. e. in mundo intelligibili] abundant ubertate, robore atque lætitia, utpote quæ in vita sublimia, sunt et ab uno fonte derivata, unaque qualitate prædita quæ cæteras in se est complexa: ut sapores dulces, odores suaves, colores perspicuos concordes sonos, et rerum tactilium differentias, cæterasque perfectiones."—i. e. "Those things which are in the intelligible world, abound in fertility, strength, and joy, as subsisting in a more elevated life, and as derived from one fountain, and endued with one quality, which comprehends in itself all other qualities; such as sweet sapors, pleasant odours, transparent colours, concordant sounds, the differences of tangibles, and other perfections." Lib. 8, cap. 3.—μη δε μιας εχει πενιας, μηδ᾽ απορι ας ουσης, αλλα παντων ζωης πεπληρωμενων, και οιον ζεοντων. εστι δ᾽ αυτων οιον η ρωη, εκ μιας πηγης, ουχ οιον ενος τινος πνευματος, ἢ θερμοτητος μιας, αλλ᾽ οιον ει τις ην ποιοτης μια πασας εν αυτη εχουσα, και σωζουσα τας ποιοτητας, γλυκυτητος μετ᾽ ευωδιας, και ομου οινωδης ποιοτητος, και χυλων απαντων δυναμεις, και χρωματων οψεις, και οσαι αφαι γινωσκουσιν. εστωσαν δε και οσα ακοαι ακουουσι και ρυθμος πας.—i. e. "There is no penury there, nor any defect, but all things are full of life, and, as it were, fervid. But there is one efflux of them, as it were, from one fountain; not as if from one certain spirit, or one heat, but as if there was one quality, containing and preserving itself all qualities, viz. sweetness, together with fragrance, a vinous quality, the powers of all juices, and the splendour of colours, together with such things as are known by the touch. Let there, likewise, be there every thing that is audible, and all rythm."—Ennead 6, lib. 7, cap. 12.

The following passage likewise is evidently taken from Plotinus: "Ut enim viator naturâ terrenus, terra iter facit, quæque è terra oriuntur, terrena sunt, quanquam maxima varietate, distincta: sic omnia quæ in illa vitali regione moventur, vitali quoque motu cientur, eademque sunt vitalia."—i. e. "For as a traveller who is himself of an earthly nature, journeys through earth, and those things which originate from the earth are terrene, though distinguished by the greatest variety; so all things which are moved in that vital region, are also excited by a vital motion, and are themselves vital." Lib. 8. chap. 5. The words of Plotinus are: παν δε δια ζωης η πορεια, και δια ζωων παν. ωσπερ και το δια γης ιοντι, παντα α διεξεισι γη, καν διαφορας εχη η γη. και εκει η μεν ζωη δι ης ηαυτη.—i. e. "The whole of the progression [in the intelligible world] is through life, and through animals; just as to him who travels through the earth, all that occurs to him is earth, though the earth is distinguished by differences. And there also the life through which the progression is made is the same."

Compare also the beginning of the 21st chap. of the 12th book with the end of the 12th chap. of the first book of the 5th Ennead of Plotinus; the whole of the 11th chap. of the 14th book, with the 4th chap. of the 8th book of the 5th Ennead; and the 14th and 15th chapters of the 14th book, with the 6th and 7th chapters of the same book of the same Ennead, and you will find indubitable proofs of the plagiarism of the Arabian author. In short, the whole fourteen books will be found on diligent inspection to be nothing more than a barbarized collectanea from the works of Plotinus.

Very judicious therefore is the remark of Dr. Friend[1], "That it is a fault common to all the editors of the Arabian writers, as well as of those who have written expositions on them, to magnify indifferently, and without any distinction, this or that author, as an original, and as one who has peculiar excellencies in him. *Few of them inform us where they borrowed from the Greeks, and scarce one of them seems to apprehend how much they stole from one another.*" That this indeed should be the case with the Arabian writers posterior to the era of Mahomet, is by no means wonderful. For the character of a people must principally depend on the religion they profess; and as that of Mahomet may be considered as the consummation of imposture, it naturally follows that the professors of it will be consummately fraudulent.

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[1] In his History of Physic. Vol. 2. p. 125.

I shall therefore conclude these observations on the barbarous state of philosophy and literature in the scholastic age, with the account given of it by Roger Bacon in different parts of his works, and a summary relation of the various fortune of Aristotle's philosophy in the academy of Paris. The regulars at that time, he informs us, both Dominicans and those of his own order, studied chiefly scholastic divinity[a]. The seculars applied themselves to the Roman laws, but never turned their thoughts to philosophy. Nay the philosophy of Aristotle was so little cultivated, that it was condemned at Paris about the year 1204. It had been less in vogue it seems in England, because it had not been translated into Latin, as that of Plato was: some pieces of it only began to be read about thirty years before. No one had ever read any lecture on perspective at Oxford prior to the year 1267, and this but twice since the establishment of that University. However at Paris they then knew nothing of this science, and there were but three in England who understood it. So that the scholars, as they were then called, were fitter for a cradle than a chair. If the study of philosophy was so much neglected, that of languages was no less. At that time there were not four among the Latins who understood the grammatical rudiments of Hebrew or Greek, much less of Arabic; and even the Latin tounge, as to the correctness or beauty of it, was scarcely known to any. We may conjecture, therefore, how well any translation from the learned languages was performed in this dark period of time. To give a few instances, Michael Scotus, who called himself *grandis astronomus* of the emperor Frederick II. and pretended to translate Avicenna, knew nothing of Arabic, and stole what he had from one Andrew, a Jew. About the same time also Hermannus Alemannus made a Latin version of logic from the Arabic, and represented himself in the title as being perfectly well skilled in both languages; though he was not ashamed to confess to Bacon, that he was so entirely ignorant both in those tongues and in logic itself, that he had hired some Saracens in Spain to do it for him. Master Paravicius, who styled himself *Physicus*, published a translation of Avenzoar from the Hebrew copy, in 1281, but was so modest as to add, *ipso sibi vulgarizante magistro Jacobo Hebræo*. As to mathematics in general, Bacon owns that *Robert Grostest*, bishop of Lincoln, and his brother friar, *Adam de Marisco*, were eminent in this way[9]; and indeed they were not only so in this, but in other parts of learning; but they died when Bacon was in the flourishing period of his life. Hence, in his later years, giving an account of what steps were taken in this branch of knowledge, he informs us, that they were but four in Europe, of which his pupil *Johan. Londinensis* was one, who had made any progress in that science; the rest, he tells us, stuck in the first Elements at the fifth proposition of Euclid, which afterwards was called *pons asininus, or the ass's bridge*.

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[a] Vid. Hist. Antiq. Oxon. passim, and Friend's History of Physic.

With respect to the various fortune of the Philosophy of Aristotle in the Academy of Paris, the following is a summary account of it from the treatise of Joh. Launojus, a Sorbonic divine, on that subject.

In the year 1209 the works of Aristotle were condemned to the flames, because they occasioned the errors of Almaricus, and might hereafter be the causes of new errors. In the year 1215, Pope Innocent III. having ordered the Parisian academy to be reformed, forbade the Metaphysics and Physics of Aristotle to be read, but ordered his Logic to be received instead of that of Augustin. And in 1231, Pope Gregory IV. forbade the Physical and Metaphysical treatises of Aristotle to be read, till they had been examined and purified from all suspicion of error; but in 1265, by the decree of the Apostolic Legate Simon, the reading of Aristotle's Physics and Metaphysics was interdicted, not with a particular stipulation, as Pope Gregory had done, but simply and unconditionally.

By the instrument however of the two cardinals John and Ægidius, who were sent by Pope Urban V. to reform the academy of Paris, not only the Organnon of Aristotle was permitted to be read, but also the reading of his treaties On the Soul, On Generation and Corruption, On the Heavens, of his Parva Naturalia, and his Metaphysics, was enjoined. Launojus farther observes, that in 1387, Thomas Aquinas was censured by the Pariscian theologists, for having too much applied certain words of Aristotle to theological conclusions. That Clement VII. Petrus de Alliaco, Joh. Gerson, et Nic. de Clemangis, Parisian theologists, reprobated the philosophy of Aristotle; and that Vicentius Ferrerius, among other passages has the following: "*Prædicare verba damnatorum, damnatio est: dicit enim Hieronymus, quod Plato et Aristotles, in inferno sunt.* i. e. "*To proclaim the words of the damned is damnation; for Jerom says, that Plato and Aristotle are in hell.*" Yet Nicholas V. who was Pope in the year 1447, is praised by Cardinal Bessarion, because he not only approved of the reading of all the works of Aristotle, but ordered them to be again translated into Latin. And in 1452, the Cardinal Totavillæus, being sent by Charles VII. to reform the academy at Paris, besides the books permitted by the commissaries of Urban V. ordered the moral treatises of Aristotle to be read. And here the words of Luther deserve to be recorded for the truth they contain, as they are cited by Hieronymus Hangestus, a Parisian theologist, in a treatise which he published against Luther. "Scholastica theologia est ea, quæ a Parissiensium Sorbona mixtione quadam ex divinis eloquiis et philosophicis rationibus, tanquam ex Centaurorum genere biformis disciplina conflata est."—i. e. "The scholastic theology is that which consits of a certain mixture from the scriptures and philosophic arguments, being as it were a biformed discipline, as if from the race of the Centaurs."

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[9] Specul. Mathem.

After the fruitless opposition of Ramus to Aristotle, and the books of Ramus were condemned, by an edict of Francis I. not only the logical writings of Aristotle, which Ramus principally opposed, were vindicated and commended, but likewise all his works. Launojus observes, that Francis by this edict did that which neither Constantine, nor Theodosius, nor Justinian, nor Charles the Great, nor any other prince, had done before,—for Philip Augustus saw the works of Aristotle burnt, and was silent. Besides, Francis did this by the advice of those persons whose ancestors had judged that the works of Aristotle should be committed to the flames.

Lastly, in a new reformation of the Parisian academy in the year 1601, the Logic, Ethics, Physics and Metaphysics of Aristotle were ordered to be taught. And in 1624 the anti-Aristotelic theses of Joh. Bitaudus, Antonius de Villon, and Steph. de Claves, which were published, were censured by the Academy; Bitaudus with the other two were ordered by the Parisian senate to quit Paris within twenty-four hours; nor was any one permitted to sell those theses, or publish them, or maintain any dogmas contrary to ancient and approved authors, without undergoing corporal punishment for so doing.

Such was the fate of the writings of Aristotle in the Academy of Paris, by which they were sometimes defamed, and sometimes applauded, sometimes forbidden, and sometimes ordered to be read. And in such a variation of fortune this is most singular, that the defamation and the applause were alike ridiculous, as Aristotle was no more understood by those who approved than by those who rejected him. For the decision of the latter was the result of theological cabal, and that of the former of scholastic jargon. In consequence of mingling modern theological tenets with the doctrines of Aristotle, neglecting to study the Stagirite in his own language, and also his Greek commentators, and considering his philosophy as entirely dissonant from that of Plato, those by whom he was applauded either perverted, or by no means fathomed the depth of his meaning; and those by whom he was rejected were such as subjugated their reason to the tyrannic dogmas of the Catholic faith.

CHAPTER IV.

After the dreadful darkness which accompanied the era of the schoolmen, it might be reasonably expected that the salutary light of genuine philosophy would have been every where diffused, through the most laudable exertions of the Medicean family to disseminate the writings of the Greeks; particularly as the works of Plato and Aristotle, and also of their best disciples, were read in their original language, and translations made of them by learned men of that period immediately from Greek into Latin. This however was far from being the case. For though the darkness, and its attendant barbarism, and ecclesiastical bigotry, were somewhat dispersed, and there was something like the dawn of philosophy, yet after all it was not her genuine light, and the eye in vain anxiously waited for her meridian beams. Men indeed eminently skilled in the Greek language flourished at that time, viz. Georgius Gemistus, or as he is generally called Pletho, Cardinal Bessarion, Trapezuntius, Theodorus Gaza, Nicolaus Leonicus Thomæus, Marcus Musurus, Joannes Argyropilus, Marsilius Ficinus, Phillippus Valor, Joannes Picus Mirandula, Hermolaus Barbarus[1], and many others; but it will be found on examination that even the most illustrious of these were by no means legitimate students either of Plato or Aristotle, though they have been so much celebrated by critics and biographers for their profound knowledge of the writings of these philosophers. For Pletho was not satisfied with attempting to prove that there is a great difference between the Platonic and Aristotelian philosophy, but he even proceeded to gross invective against Aristotle. And to those who are adepts in the theology of Plato, it will be sufficient to observe as a proof of his ignorance of it, that in his epitome of the dogmas of Zoroaster and Plato[2], he makes Jupiter to be the greatest of the gods, and Neptune to be his most ancient offspring, though both according to Plato and the Chaldean theologists, *the one* or *the good* is the highest god, from whom immediately proceeds an order of gods denominated *intelligible*, after this another order denominated *intelligible and at the same time intellectual;* next to this another order of gods denominated *intellectual* only, at the extremity of which Jupiter the demiurgus subsists; and then follows the *supermundane* order, the first triad of which consists of Jupiter, Neptune and Pluto. For there is a twofold Jupiter according to the theology of the Greeks, one subsisting according to an *intellectual*, and the other according to a *supermundane* characteristic. Indeed, it must be evident to every intelligent mind, that the fabricator of the universe, who in the Grecian theology is denominated Jupiter, is not according to Plato the highest god. For in the Timæus he says, "*That to discover the artificer and father of this universe is difficult, and when found it is impossible to reveal him by words to all men.*" τον μεν ουν ποιητην και πατερα τουδε του παντος, ευρειν τε εργον, και ευροντα εις απαντας αδυνατον λεγειν. So that the demiurgus according to Plato is not *perfectly ineffable*, but cannot be rendered manifest by language to every one. But of the first cause of all or *the one*, he says in the conclusion of the first hypothesis of the Parmenides, "*That no name pertains to it, nor discourse, nor any science, nor sense, nor opinion; and that in consequence of this, it can neither be named, nor spoken of, nor become the subject of opinion, nor be known, nor perceived, by any being.*" ουδ᾽ αρα ονομα εστιν αυτῳ, ουδε λογος, ουδε τις επιστημη, ουδε αισθησις, ουδε δοξα. Ου φαινεται.. ουδ᾽ ονομαζεται αρα, ουδε λεγεται, ουδε δοξαζεται, ουδε γιγνωσκεται, ουδε τι των οντων αυτου αισθανεται. Plato also in his 6th Epistle most clearly distinguishes Jupiter from the cause of all. For he concludes that Epistle as follows: "*By oath adducing as a witness that God who is the leader of all things both present and future, and also*

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[1] Hermolaus is said to have raised the devil, in order to learn the true meaning of the word *εντελεχεια*, employed by Aristotle in his treatise On the Soul. Had he read the commentary of Simplicius on that treatise, he would have known the real meaning of that word much better than he did by the devil that he raised.

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[2] Vid. Fabric. Biblioth. Græc. vol. 14. p. 137.

the father and lord of this leader and cause, whom, if we philosophize truly, we shall all of us clearly know, as far as it is possible for happy men to know him." και τον των παντων θεον ηγεμονα των τε οντων και των μελλοντων, του τε ηγεμονος και αιτιου πατερα επομνυντας, ον αν οντως φιλοσοφωμεν, εισομεθα παντες σαφως εις δυναμιν ανθρωπων ευδαιμονων. That this dogma of Plato respecting Jupiter was also the dogma of the Chaldæans, is evident from barely inspecting the Chaldæan fragments that are extant at present, and the expositions of Chaldaic dogmas by Psellus[3].

Ficinus indeed, appears to have known more of the philosophy of Plato than any of the learned that lived at that period, or that have lived since; but as the philosophy of Plato cannot be separated from his theology, for it depends upon it, and as both are consummately scientific, Ficinus by every where endeavouring to make the theological tenets of Plato conformable to those of Christianity, confounds and corrupts the one without benefitting the other. For it must be obvious to every one, that the heathen is essentially different from the christian religion.

As to Picus Mirandula, after the instances already given of the barbarous state of philosophy among the schoolmen, the following eulogium which he passes on them, will be a sufficient proof that he had made no solid proficiency in the study of Plato and Aristotle. In his apology, therefore, for his theses, he says of the schoolmen: "Adde quod in unaquaque familia est aliquid insigne, quod non sit ei commune cum cæteris. Atque, ut a nostris ad quos postremò philosophia pervenit, nunc exordiar, Est in Joanne Scoto vegetum quiddam, atque discussum. In Thoma solidum, et æquabile. In Ægidio tersum, et exactum. In Francisco acre et acutum. In Alberto priscum, amplum et grande. In Henrico, ut mihi visum est, semper sublime et venerandum."—i. e. "In each family of them there is something excellent which it has not in common with the rest. And that I may now begin from ours to whom philosophy arrived last of all. In Johannes Scotus there is something florid and discussed. In Thomas Aquinas something solid and equable. In Ægidius something terse and exact. In Franciscus [Mayronis] something sharp and acute. *In Albertus Magnus, something ancient, ample, and grand.* In Henricus [de Gandavo] as it appears to me, there is always something sublime and venerable." As a proof likewise how little the mind of Picus had been enlarged by philosophy, one of his conclusions, in that part of his works called *Conclusiones*, is, *that it is more safe upon the whole to believe that Origen will be saved at the day of judgement, than that he will be damned.* For Picus says this because Origen, though he was converted to christianity from paganism, retained certain Platonic notions which he would not abandon even when he became a saint. After all this, what opinion ought we to form of Joseph Scaliger's eulogium of Picus, that he was *monstrum sine vitio, a monster without a fault?* Certainly nothing more than that it is the praise of a great verbalist.

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[3] See my collection of the Chaldaic Oracles in the Monthly Magazine.

Of the other learned men that I have mentioned, some either divulsed Aristotle from Plato, though the philosophy of these two great luminaries is one and the same; or like Ficinus they perverted this philosophy by endeavouring to adapt it to the doctrines of their own religion; or they barely translated into Latin, parts of Aristotle, and some of his Greek commentators, without being at all adepts in the writings which they translated. Hence there is not any writer of that period, and the remark equally applies to writers in subsequent periods, who has promulgated the philosophy of Plato and Aristotle, unmingled with spurious opinions, or who has given unequivocal proofs of his having made a solid proficiency in that philosophy.

CHAPTER V.

It is a fact almost unparalleled for its singularity, that, after the dark era of the schoolmen, when the works of Aristotle, together with his Greek commentators, were published in their original language, and when the art of printing had rendered them common, other philosophies should have been substituted for that of Aristotle, by men who solely derived their knowledge of his doctrines from the barbarous lucubrations of the schoolmen. In the mathematical sciences, and in every branch of polite literature, men willingly submit to study the Greek writers themselves on these subjects, a long series of ages having proved that in them alone perfection is to be found; but with respect to philosophy, the scholastic jargon was no sooner exploded, than certain men whose genius was indeed great but distorted, and whose ambition far exceeded the magnitude of their genius, instead of first endeavouring to become thoroughly acquainted with the doctrines of Aristotle from genuine sources, of studying him in his own language, and availing themselves of the elucidations of his best disciples, *indolently* took the dogmas of the schoolmen for those of Aristotle, and *lawlessly* promulgated a philosophy of their own. The men I allude to are no other than Lord Bacon, Des Cartes, and his disciple Malbranche, Newton, Boyle, and Locke. These men having the sagacity to perceive that nothing could less deserve the appellation of philosophy than the jargon of the schoolmen, and hastily and falsely concluding that it was legitimately derived from Aristotle, in reprobating his doctrines either founded their defamation on the authority of the schoolmen, or on a cursory inspection of his works in the original. Nothing surely can be more unpardonable than such conduct; nothing can more plainly indicate a lawless and unbounded ambition in those who were guilty of it; and nothing can be so foreign from a genuine love of truth. For after what we have observed respecting the schoolmen, I trust it must be obvious to every one, that their authority, in what pertains to philosophy, is so far from carrying any weight, that it ought never to be adduced; and to be satisfied with cursorily inspecting the writings of Aristotle in the original, and to expect to become adepts in his philosophy as it were by intuition, discovers the greatest perversion of intellect, united with the most consummate arrogance. It also indicates the most profound ignorance of the genius of ancient philosophy. For the great philosophers of antiquity, besides the extraordinary abilities they possessed, spent a considerable portion of their lives in imbibing the doctrines of others, with a docility without example. Pythagoras was a scholar fifty years under the greatest masters of his time. Plato was the disciple of Socrates, Archytas, and Cratylus, above forty years, and Aristotle studied under Plato more than twenty years. Now, is it reasonable to suppose that men of a genius so confessedly great, and who have in all ages been more or less celebrated for their wisdom, would have bestowed so much application, and spent so much time in acquiring a knowledge of the doctrines of their masters, unless that knowledge had been of the most exalted kind, and was no less arduous in its attainment, than important in its consequences? Surely a little reflection must have convinced every mind of this that was not purblind through arrogance, and giddy through ambition.

That this knowledge is thus arduous, sublime, and important, is evident from what we have already observed in the beginning of this Dissertation; viz. that the end of Aristotle's moral philosophy is perfection through the virtues, and of his contemplative philosophy, an union with the one principle of all things. All the works of Aristotle lead us to the attainment of this end. For some of them unfold to us the art of demonstration; others, that we may become virtuous, instruct us in morals; and lastly, others lead us to the knowledge of natural things, and afterwards to those luminous beings which have a supernatural subsistence. The philosophy of Aristotle, however, is so scientifically connected in all its parts, that his sublimest theoretic doctrines cannot be understood by any one who has not been previously disciplined in those that are less sublime; nor are even the latter to be apprehended without long and laborious study, accompanied with an ardent love of truth, an extreme docility, and, as the consequence of it, an indefatigable perusal of the writings of his Greek disciples. Surely the moderns I have above mentioned, in thus superficially inspecting the works of Aristotle, must also have been ignorant that all the great philosophers of antiquity wrote in such a way as to conceal the sublimest of their doctrines from the vulgar, as well knowing that they would only be profaned by them without being understood; the eye of the multitude, as Plato says, not being strong enough to bear the light of truth.

Hence,

Hence, as Proclus well observes, "it is needless to mention that it is unbecoming to speak of the most divine of dogmas before the multitude, Plato himself asserting that all these are ridiculous to the many, but in an admirable manner are esteemed by the wise. Thus, also, the Pythagoreans said, that of discourses some are mystical, but others adapted to be delivered openly. With the Peripatetics likewise, some are esoteric, and others exoteric; and Parmenides himself wrote some things conformable to truth, but others to opinion; and Zeno calls some assertions true, but others adapted to the necessary purposes of life[9]."

The following extracts from the writings of the above-mentioned moderns, will convince the reader of the truth of what I have asserted, viz. that they founded their defamation of Aristotle either on the authority of the schoolmen, or on a cursory inspection of his works.—And, to begin with their leader, Lord Bacon: In the first place, he reprobates the confidence of Aristotle as follows (in Vol. 4 of his works, p. 87). "Qua in re Aristotelis confidentiam proinde subit mirari; qui impetu quodam percitus contradictionis, et bellum universæ antiquitati indicens, non solum nova artium vobacula pro libitu cudendi licentiam usurpavit; sed etiam priscam omnem sapientiam extinguere et delere annisus est. Adeo ut neque nominat uspiam auctores antiquos, neque dogmatum eorum mentionem ullam faciat, nisi quo aut homines perstringeret, aut placita redargueret. Cæterum de viro tam eximio certe, et ob acumen ingenii mirabili, Aristotele, crediderim facile hanc ambitionem eum a discipulo suo accepisse, quem fortasse æmulatus est; ut si ille omnes nationes, hic omnes opiniones subigeret, et monarchiam quandam in contemplationibus sibi conderet."—Here he says, that Aristotle, impelled by contradiction, and proclaiming war against all antiquity, not only introduced new terms of art at his pleasure, but also endeavoured to extinguish and obliterate all ancient wisdom. That in consequence of this, he never names any ancient authors, nor mentions their dogmas, except that he may either censure the men, or confute their opinions. And he concludes with observing, that he should believe Aristotle, who was certainly an excellent man, and wonderful for the acuteness of his genius, derived this ambition from his disciple Alexander, that as the latter subdued all nations, so the former might subjugate all opinions, and procure for himself a certain monarchy in contemplations.

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[9] οτι δε απρεπη τα θειοτατα των δογματων εστιν, ως ακοας φερομενα των πολλων, ουδεν δει λεγειν, αυτου πλατωνος ειποντος, ως παντα ταυτα καταγελαστα μεν εστι τοις πολλοις, θαυμαστως δε αξια τοις σοφοις. ουτω δε και οι πυθαγορειοι των λογων τους μεν εφασκον ειναι μυστικους, τους δε υπαιθριους, και οι εκ του περιπατου, τους μεν εσωτερικους, τους δε εξωτερικους, και αυτος παρμενιδης, τα μεν προς αληθειαν εγραψε, τα δε προς δοξαν, και ο ζηνων δε τους μεν αληθεις εκαλει των λογων, τους δε χρειωδεις. Procl. MS. Comment. in Parmenidem.

Nothing surely can be more false than the whole of this, and nothing can more satisfactorily prove Lord Bacon's ignorance of the true character of Aristotle, and of the aim and end of all his writings. For I trust the intelligent reader is sufficiently convinced from the perusal of the former part of this Dissertation, that Aristotle was neither impelled by contradiction, nor hostile to all antiquity; but that when he confutes the apparent meaning of the ancients, it is in order to prevent men of superficial understandings being misled by mistaking the *apparent* for the *real* meaning of what is written. Hence Aristotle, so far from endeavouring to extinguish and obliterate all ancient wisdom by this mode of writing, aims on the contrary to diffuse it as much as possible, and to preserve it inviolate and pure. He does not, therefore, proclaim war against, but is the friend and benevolent guardian of all antiquity. Whenever, also, he introduces new terms, he does this from necessity, and not as Lord Bacon has done, as we shall hereafter see, from that very spirit of contradiction which he ascribes to the Stagirite. I refer the reader who wishes to be convinced of this, to the notes in my translation of Aristotle's works on the parts where these terms occur. As to the last charge against Aristotle, that of boundless ambition, like his pupil Alexander, and a desire of subjugating all opinions to his own, and, as Bacon elsewhere expresses it, believing, like the Othoman emperors, that he could not reign with safety unless he slaughtered all his brothers, it is perhaps one of the most remarkable instances upon record, of one man fancying that defect to be in another for which he is himself notorious. That this was actually the case with Lord Bacon we shall shortly see, when we come to examine his philosophy;

phy; but that Aristotle had by no means this ambition we shall now demonstrate.

That Aristotle then every where recommends investigation and doubting, and displays no less modesty[1] in proposing doubts, than sagacity in dissolving them, must be obvious to every unprejudiced mind from barely inspecting his works. For having exercised himself in that part of Plato's dialectic, which proceeds through opposite arguments, when, in philosophising a question is proposed, before he solves it he usually introduces another question, and from the solution of the latter solves the former. He often likewise brings many doubts together, which he dissolves by one and the same, or by continual answers. But, that the reader may be fully convinced that the philosophy of Aristotle is of all others most foreign to dogmatic assertion, and most friendly to doubting, I shall, in the first place, present him with an account of the words and the modes of expression by which he signifies doubting. Aporein (απορειν) then, is properly to doubt, and this is the word which Aristotle most frequently uses; but the formulæ by which he expresses that word in the investigation of truth, as well in the theoretical as in the practical parts of his philosophy, are various. And these are sometimes subservient to the doubts proposed from the beginning of the chapter, and to what has been adduced in former chapters, and sometimes they promote a more diligent investigation in the middle or end of a chapter[2].

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[1] The modesty in particular with which his Problems are invariably solved, is no less admirable in so transcendent a genius, than the sagacity displayed in their solution.

[2] Thus, among others, lib. iii. Metaphys. c. 1, et lib. xi. c. 1, απορησειεν αν τις, *some one may doubt*. Likewise, lib. vii. c. 1 et c. 9. lib. iii. c. 4 et 6. lib. ii. de Anima c. 11, et lib. i. c. 8. lib. i. Mag. Mor. c. 35. lib. ii. Mag. Mor. c. 3, 6, et 11. lib. vii. de Moribus, c. 2. lib. i. Meteor. c. 3 et 14. lib. i. de Anima, c. 1 et. 7. lib. v. de Moribus, c. 11, et lib. ii. c. 3. lib. v. Eudem. c. 12. lib. ix. c. 2. lib. v. Nat. Ausc. c. 9. lib. vii. c. 5. lib. i. de Gen. et Corr. c. 3. lib. de Sensu et Sensili, c. 5 et 6. et de Incessu Animalium, c. 11. lib. ii. de Gen. Animal. c. 2. lib. ii. de Cœlo, c. 14. In lib. ii. de Generat. Animalium, c. iii. we have other formulæ, τουτων δ' εχομενον εστι και απορησαι, &c. τα τοιαυτα απορειται, ποτερον, &c. απορειν αναγκαιον. lib. iii. Met. c. 6. lib. iv. Nat. Ausc. c. 4. lib. ii. de Sophist. Elenchis, c. 33. δει απορησαι, lib. iii. Met. c, 1. Likewise τῳ απορειν is joined with τῳ βουλευειν, lib. vi. de Moribus, c. 11. The philosopher, also, by the word ατόρια differently expresses doubt: for he either expresses it through this, εστι δε απορια, lib. de Animalium

Sometimes the word *απορια, doubt*, alone in the singular or plural number comprehends the matter of the whole, or the better part of the chapter, by which the proposition of things dubious is exhibited[3]. and sometimes other words joined with this denote the same doubt[4]; to all which the words *ευπορειν* and *ευπορια*, signifying abundance, correspond as the end[5].

In the next place, it will be proper to observe, that metaphysical doubting, according to Aristotle, begins from an ignorance of the causes of being, from whence admiration of the greatest effects arises, and then receives its consummation when the causes and principles of the universe are known. But the philosopher in the third book of his Metaphysics, which is wholly employed in the enumeration of doubts, assigns four reasons why in the investigation of truth we should begin from doubting. The first is, "because the power of acquiring posterior knowledge is derived from the solution of prior doubts." Hence, in his Nicomachean Ethics, he says that the solution

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Animalium Motione, c. 4. et *απορια δε εστι διττη*, lib. ii. de Sophist. Elench. c. 33. lib. iii. Met. c. 1. or by *αποριαν εχειν*, lib. i. de Anima, c. i. et lib. ii. c. 5. et c. 11. lib. iii. Nat. Ausc. c. 5, lib. vii. Metaphys. c. 5. lib. i. Nat. Ausc. c. 3. lib. iv. Metaphys. c. 3. lib. i. de Gen. et Corr. c. 3. or by *αποριαν παρασχειν*, as lib. iii. Met. c. 1. et lib. ii. Mag. Mor. c. 6. or by *ποιειν απορίαν*, as lib. iii. Nat. Ausc. c. 5. or by *αποριαν απορειν*, as lib. viii. Met. c. 3.

[3] This may be seen in lib. iii. Metaphys. c. 1. lib. iii. de Rep. c. 3. lib. viii. Met. c. 6. lib. xii. Met. c. 6. lib. xiii. Met. c. 1 et 2. lib. iv. Nat. Ausc. c. 3. lib. ii. de Cœlo, c. 12. lib. i. de Gen. et Corr. c. 11. lib. i. de Moribus, c. 10. lib. ii. de Moribus, c. 3. lib. iv. de Moribus, c. 2. et lib. ix. c. 2 et 3. et 8, et 9, et. 11. lib. i. Mag. Moral. c. 35. lib. vi. Eudemior, c. 2 et lib. vii. c. 8, lib. iii. de Anima, c. 10. lib. de Animalium Incessu, c. 10.

[4] Viz. Either *επισκεπτεσθαι*, as in lib. de Animalium Motione, c. iv. and *σκεψις*, as lib. ii. Mag. Mor. c. 4. lib. i. Meteor, c. 13. et lib. viii. Nat. Ausc. c. 3. lib. i de Moribus, c. 10. He also uses the word *απορημα* as well elsewhere as lib. iv. Nat. Ausc. c. 6. lib. xi. Met. c. 2. and *διαπορειν*, lib. iii. Met. c. 1. lib. iv. c. 5. et lib. i. de Moribus, c. 11. et 2. lib. vii, c. 7. Categ. de Relatis, c. 7. lib. xi. Met. c. 11, lib. i. de Gen. et Corr. c. 5. et 10. lib. i. Meteor. c. 3. lib. iv. Nat. Ausc. c. 5. et. lib. i. Eudem. c. 4.

[5] As may be seen lib. iii. Met. c. i. et lib. i. de Anima, c. 2. And the words *αμφισϐητειν* and *αμφισϐητησις* denote the same doubting. See lib. i. Eudem. c. 3. et 4. lib. vi. c. 2. lib. i. de Cœlo, c. 11. lib. 3. Met. c. 1.

of doubt is invention [6]. The second reason is, "because those that investigate without having previously doubted, resemble those who are ignorant whither they ought to go [7]." For he shows that doubting is a road through which we must necessarily pass in the investigation of truth. Not that we are to be continually employed in doubting, but only till we arrive at truth, the object of our search. The third reason which Aristotle assigns is, "because without doubting those that investigate cannot know whether they have found what they explore. For, the end to these is not manifest; but is manifest to those who previously doubt in a proper manner." Hence, those only who have previously doubted, know truth when they have found it; but those who without doubting happen to meet with truth, are ignorant that they have found it. And the fourth reason which the philosopher assigns why we should begin from doubting is, "because he is necessarily better fitted to judge who has heard all the opposite reasons, which may be compared to the adversaries in a law-suit." Conformably to this, he elsewhere observes, "that the demonstrations of contraries are doubts concerning contraries; and, at the same time, assertions will be more credible, if, previous to their being delivered, all that can be urged in defence of the contending arguments is heard [8]." In short, the whole of his Metaphysics consists either in the enumeration and solution of doubts, or in the discussion of such things as are subservient to their solution. And we have largely shown that every part of his works abounds with doubting, and that he every where exhorts the reader to doubt, as above all things necessary to the perception of truth. It may, therefore, from all this be fairly and safely concluded that those who have represented his philosophy as tyrannical, have either ignorantly confounded it with the barbarous reveries of the schoolmen, or, desirous of becoming dictators in philosophy themselves, have most unjustly ascribed to the Stagirite that unbounded ambition with which they were so eminently inspired.

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[6] ῾Η γαρ λυσις της αποριας ευρεσις εστι. Lib. viii. c. 1.

[7] The words απορησαι, διαπορησαι, and ευπορησαι, which the philosopher uses in this place, accord with each other; for they refer to those that are travelling; πορος signifying a *way*. But by the verb απορησαι in the beginning of this passage and elsewhere, he signifies a previous doubting of particulars; but by διαπορησαι a more profound investigation, and a solicitude of penetrating through all doubts, and increasing the doubt itself by various reflections and arguments.

[8] ῾Αι γαρ των εναντιων αποδειξεις, αποριαι περι των εναντιων εισιν, ἁμα δε και μαλλον αν ειη πιστα τα μελλοντα λεχθησεσθαι προακηκοοσι τα των αμφισβητουντων λογων δικαιωματα. Lib. i. de Cœlo, c. 10.

The next extract with which I shall present the reader from the works of Lord Bacon, is of a most extraordinary nature; for in this he prefers to Aristotle, Democritus, and other ancient philosophers, who removed God and intellect from the fabric of things, attributed the structure of the universe to Fate or Fortune, and ascribed the causes of particulars to the necessity of matter, without the intermixture of final causes. And he considers these philosophers, so far as pertains to physical causes, to have been much more solid, and to have penetrated deeper into nature, than Plato and Aristotle. He adds also, as the sole cause of this, that the former philosophers never attended to final causes; but the latter perpetually inculcated them. And that Aristotle is more to be accused in this respect than Plato, because he omitted the fountain of final causes, viz. God, substituted nature for God, and embraced final causes rather as a lover of logic than of theology. "Quapropter philosophia naturalis Democriti, et aliorum, qui deum et mentem a fabrica rerum amoverunt; et structuram universi infinitis naturæ prælusionibus et tentamentis (quas uno nomine fatum aut fortunam vocabant) attribuerint; et rerum particularium causas materiæ necessitati, sine intermixione causarum finalium, assignarunt; nobis videtur (quantum ex fragmentis et reliquiis philosophiæ eorum conjicere licet) quatenus ad causas physicas, multo solidior fuisse, et altius in naturam penetrasse, quam illa Aristotelis & Platonis: hanc unicam ob causam, quod illi in causis finalibus nunquam operam triverunt; hi autem eas perpetuo inculcarent. Atque magis in hac parte accusandus Aristoteles quam Plato: quandoquidem fontem causarum finalium, Deum scilicet omiserit, et naturam pro Deo substituerit, causasque ipsas finales, potius ut logicæ amator, quam theologiæ, amplexus sit." Vol. 4. p. 98.

I call this a most extraordinary passage for two reasons, one, for its folly, and the other for the profound ignorance of the works of Aristotle which it displays. For can any thing indicate greater folly than to prefer those philosophers who never attended to final causes, to those who perpetually inculcated them? For, as Aristotle justly observes in his Posterior Analytics, the investigation of the cause *why* a thing is, can only be terminated by the discovery of the final cause. And without the knowledge of the *why*, there can be no such thing as science. So that to blame Aristotle for perpetually inculcating final causes, is to blame him for inculcating that to which scientific knowledge inevitably leads, and without which demonstration would be useless, and investigation endless.

But this passage also shows, that Lord Bacon was profoundly ignorant of the works of Aristotle. For can any thing more plainly indicate this than the accusation, "that Aristotle omitted the fountain of final causes, viz. God, that he substituted nature for God, and embraced final causes rather as a lover of logic than of theology?" The accusation indeed is so obviously false, that it is impossible it could have been made by any one who had merely inspected the works of Aristotle through the medium of an index; and I hardly think it would be made by any hackney writer of the present age, if he were hired to collect the dogmas of Aristotle from his works. For in the 7th chapter of the 12th book of the Metaphysics, Aristotle writes as follows concerning the first immoveable mover of all things, God. κινει δε ωδε. το ορεκτον και το νοητον κινει ου κινιουμενον. τουτων δε τα πρωτα τα αυτα. επιθυμητον μεν γαρ το φαινομενον καλον· βουλητον δε πρωτον, το ον καλον. ορεγομεθα δε οτι δοκει, μαλλον ῆ δοκει, διοτι ορεγομεθα. αρχη γαρ η νοησις. νους δε υπο του νοητου κινειται.—αλλα μην και το καλον, και το δι αυτο αιρετον, εν τη αυτη συστοιχια.—οτι δε εστι το ου ενεκα εν τοις ακινητοις η διαιρεσις δηλοι. εστι γαρ τινι το ου ενεκα, ων το μεν εστι, το δε ουκ εστι. κινει δε ως ερωμενον· κινουμενον δε, τ'αλλα κινει.—εξ αναγκης αρα εστιν ον· και ῇ αναγκη καλως· και ουτως αρχη.—εκ τοιαυτης αρα αρχης ηρτηται ο ουρανος και η φυσις. διαγωγη δε εστιν, οια τε η αριστη, μικρον χρονον ημιν. ουτω γαρ αει εκεινο εστιν. ημιν μεν γαρ αδυνατον· επει και ηδονη η ενεργεια αυτου· και δια τουτο εγρηγορσις, αισθησις, νοησις, ηδιστον. ελπιδες και μνημαι δια ταυτα. η δε νοησις η καθ' αυτην, του καθ'αυτο αριστου·—και η μαλιστα, του μαλιστα. αυτον δε νοει ο νους κατα μεταληψιν του *νοητου. νοητος γαρ γινεται θιγγανων και νοων. ωστε ταυτον νους και νοητον. το γαρ δεκτικον του νοητου και της ουσιας, νους. ενεργει δε εχων. ωστε εκεινο μαλλον τουτου, ο δοκει ο νους θειον εχειν. και η θεωρια το ηδιστον και αριστον. ει ουν ουτως ευ εχει, ως ημεις ποτε, ο θεος αει, θαυμαστον. ει δε μαλλον, ετι θαυμασιωτερον. εχει δε ωδε. και ζωη δε γε υπαρχει. η γαρ νου ενεργεια, ζωη· εκεινος δε η ενεργεια. ενεργεια δε η καθ᾽ αυτην, εκεινου ζωη αριστη και αϊδιος. φαμεν δε τον θεον ειναι ζωον αϊδιον, αριστον. ωστε ζωη και αιων συνεχης και αϊδιος υπαρχει τῳ θεῳ. τουτο γαρ ο θεος.*—i. e. " But it moves as follows: That which is desirable and that which is intelligible move without being moved. But the first intelligible is the same as the first desirable; for that which *appears* to be beautiful is desirable. But the first object of the will is that which is really beautiful. However, we rather aspire after it because it appears to be beautiful, than it appears to be beautiful because we aspire after it. For the principle is intelligence; but intellect is moved by the intelligible.—Moreover, the beautiful, and that which is eligible for its own sake, are in the same co-ordination.—But that in immoveable natures there is that for the sake of which other things subsist, division manifests: for there is something to which *that for the sake of which a thing is done* belongs, of which the one is different from the other[9]. But the first mover moves as that which is beloved; and through that which is moved it moves other things. Hence, he is necessarily being; and so far as he necessarily subsists, so far he subsists according to rectitude, and is thus the principle of things.—From such a principle, therefore, as this, heaven and NATURE are suspended. But the life which he lives is the most excellent, and such as we enjoy for a small portion of time; for such a life is with him perpetual. To us indeed, this is impossible; but not to the first mover, because his energy is pleasure. And on this account vigilance, the energies of sense, and intellection, are most delightful. Hope too, and memory, are pleasing through energies. But essential intellection is the intellection of that which is essentially the most excellent; and the most essential of that which is most essential. Intellect too understands itself by the assumption of the intelligible:

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[9] Viz. That for the sake of which a thing is effected is different from the thing effected.

gible: for it becomes intelligible by contact and intellection; so that intellect is the same with the intelligible. For intellect is the recipient of the intelligible and of essence. But it energizes possessing. Hence, that which intellect appears to possess as divine, belongs more eminently to the first intellect than to ours; and his contemplation is the most delightful and the best. If, therefore, God always possesses that excellent condition of being which we sometimes possess, it is admirable; but if he possesses it in a still higher degree, it is still more admirable. In this manner, however, he subsists. Life also is present with him; for the energy of intellect is life; and he is energy. But essential energy is his most excellent and eternal life. And we say that God is an animal eternal, and the most excellent; so that life and duration continued and eternal are present with God. For God is this." I trust the reader who has perused the account given from Aristotle of causes in the former part of this Dissertation, need not be told that God in the above citation is most evidently celebrated as the fountain of final causes. The falsehood also is most obvious of the assertion, *that Aristotle substituted nature for God*; for in this quotation he expressly says, *that heaven and* NATURE *are suspended from God.*

In the following citation we shall see that Lord Bacon confounds Aristotle with the schoolmen. For in the 63rd Aphorism of his Novum Organum, after ridiculously asserting that Aristotle corrupted natural philosophy by his logic, since he fashioned the world from the categories, he adds, "*that he also attributes the genus of the soul which is a most noble substance from words of the second intention.*" "Qui philosophiam naturalem dialectica sua corrupit: quum mundum ex categoriis effecerit; animæ humanæ, nobilissimæ substantiæ, genus ex vocibus *secundæ intentionis* tribuerit." In this passage he obviously ascribes to Aristotle one of the barbarous terms invented by the schoolmen; for there is no such expression in any of the works of Aristotle, or in any of his Greek commentators, as *second intention*.

CHAPTER VI.

HAVING, therefore, shown from the most indubitable evidence, that Lord Bacon was unacquainted with the writings of Aristotle, I shall in the next place demonstrate that this was also the case with the celebrated disciple of Des Cartes, Malebranche. For I shall confine my remarks to the invectives of the disciple rather than to those of the master, as the former is more virulent, and displays greater ignorance in his defamation than the latter. Malebranche, therefore, has employed the whole of the fifth chapter of the sixth book of his Search after Truth, in an attempt to confute the principles of Aristotle's philosophy, in order that he may show the superiority of the philosophy of Des Cartes[1].

"Aristotle then, says Malebranche[2], begins his treatise On the Heavens by proving that the world is perfect, in the following manner. All bodies have three dimensions, and cannot have more, because the number three comprehends all, according to the Pythagoreans. But the world is the co-acervation of all bodies, and, therefore, the world is perfect. By this ridiculous proof, it may also be demonstrated that the world cannot be more imperfect than it is, since it cannot be composed of parts that have less than three dimensions." As in the former part of this Dissertation I have given the whole of the first chapter of Aristotle's treatise On the Heavens, I refer the reader to it, and to an attentive perusal of it with the accompanying notes, and he will be immediately convinced that Malebranche had read that chapter cursorily, and without at all penetrating the depth of Aristotle's meaning. With respect to what he adds, that by the same proof employed by Aristotle to show that the world is perfect, it might also be demonstrated that it cannot be more imperfect than it is, it is sufficient to remark that this observation could only have been made by a man who thought in a superficial and rambling manner. For the intention of Aristotle in this chapter, was to demonstrate that the world is perfect so far as it is corporeal, because it consists of parts which are perfect with respect to dimensions; since that which is triply extended is all perfect so far as pertains to extension. For as Ptolemy has demonstrated in his treatise On Interval, if there were any other interval after the third dimension, it would be perfectly unmeasured and indefinite. If, therefore, the world is perfect, because it consists of parts which have perfect dimensions, the assertion of Malebranche, "that the world cannot be more imperfect than it is, since it cannot be composed of parts that have less than three dimensions," is just as if it should be said, "the world cannot be more *imperfect* than it is, because it cannot be composed of parts that have not *perfect* dimensions," which I presume approximates infinitely near to perfect nonsense.

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[1] The author of Reflections on Ancient and Modern Philosophy, says, "that Des Cartes has *raved* the best of any of the moderns."

[2] The edition that I quote is in folio, and was printed in the year 1700.

In the next place Malebranche says, "that Aristotle in the second chapter, first supposes some Peripatetic truths, as that all natural bodies have of themselves the force of moving, which he proves neither here nor elsewhere; but on the contrary asserts, in the first chapter of his second book of Physics, that to endeavour to prove it is absurd, because 'tis evident of itself, and that none but those who cannot distinguish what is known of itself from what is not, insist upon proving plain by obscure things. But it has been shown elsewhere, that it is altogether false that natural bodies should have of themselves the force of moving, and it appears evident only to such as follow, with Aristotle, the impressions of their senses, and make no use of their reason." In this citation, Malebranche, when he says that Aristotle first supposes some Peripatetic TRUTHS, doubtless intended to say *some Peripatetic* DOGMAS; for if Aristotle supposes what is true, I should not conceive that any one would attempt to confute it. But this mistake is natural enough in a man who thought and wrote in so random a manner as Malebranche appears to have done. Let us, therefore, see what the *false* Peripatetic *truths* are, which Aristotle supposes in the second chapter of his treatise On the Heavens. " He supposes, says Malebranche, that all natural bodies have of themselves the force of moving." Here Aristotle is made to say the very opposite to what he really does say; for his words are: παντα γαρ τα φυσικα σωματα και μεγεθη καθ'αυτα κινητα λεγομεν ειναι κατα τοπον· την γαρ φυσιν, κινησεως αρχην φαμεν ειναι αυτοις.—i. e. " We say that all natural bodies and magnitudes are of themselves, or essentially, moveable according to place: for we say that nature is the principle of motion to them." Aristotle, therefore, does not say that all bodies have of themselves a motive force, but that they are naturally capable of being locally moved. And if Malebranche himself had known that this was the Peripatetic truth supposed by Aristotle, I scarcely think that even he would have conceived it to be false.

" In the second place, says Malebranche, he asserts that all local motion is made in a line, either direct or circular, or composed of both; but if he would not think upon what he so rashly proposes, he ought at least to have opened his eyes that he might see an infinite number of different motions, which are not made of either the right or the circular. Or rather, he ought to have thought that the motions composed of the direct may be infinitely varied, when the compounding motions increase or diminish their swiftness, in an infinite number of different ways." Here Malebranche rambles full as much as in the before cited passage. For the words of Aristotle alluded to by Malebranche, and which immediately follow those we have just quoted, are: πασα δε κινησις, οση κατα τοπον, ην καλουμεν φοραν, ἢ ευθεια, ἢ κυκλῳ, ἢ εκ τουτων μικτη. απλαι γαρ αυται δυο μοναι. αιτιον δ'οτι και τα μεγεθα ταυτα απλα μονον, ητε ευθεια, και η περιφερης. i. e. " But all such motion as is according to place, and which we call lation, is either in a right line, or in a circle, or mixt from these; for those two motions alone are simple; and this is because a right line and a circumference are the only simple magnitudes." By connecting this with the passage before quoted, it is evident that Aristotle is here speaking of those motions only which are natural, and which actually exist in the universe, and not of the motions which may be produced by art. Hence, it is not Aristotle that did not open his eyes in asserting this; but it is father Malebranche, who being blind himself, fancied that his own blindness was in Aristotle.

Malebranche proceeds: "There are, says Aristotle, but two simple motions, the right and the circular, and therefore all the others are composed of them. But he mistakes, for the circular motion is not simple, since it cannot be conceived without thinking upon a point to which it relates, and whatever includes a relation is relative, and not simple. This is so true, that the circular motion may be conceived as produced from two motions in a right line, whose swiftness is unequal according to a certain proportion. But a motion composed of two others, made in a right line, and variously increasing or diminishing in swiftness, cannot be simple." Here, in the first place, Malebranche shows himself to have been profoundly ignorant of the obvious meaning of the term *simple motion*, viz. that it is an *uncompounded* motion; and that circular and rectilinear motions when they are natural, are therefore simple, because neither of them is composed of things of a different nature. Aristotle, therefore, shows that these alone are simple motions, from the hypothesis of lines; for all motion is produced on some linear extension. Hence, if there are only two simple lines, there are also only two simple motions. For Aristotle does not suppose magnitudes to be the *producing* causes of motions, but considers them as the *material* causes, or as having the relation of things without which motions would not exist. Malebranche sagely adds, "that whatever includes a relation is relative, and not simple." He is certainly right in saying that whatever includes a relation is relative; for relations are relatives; but he is very much mistaken in asserting that whatever includes a relation is not simple. For it is obvious that there are simple as well as compounded relations, or what would become of the doctrine of ratios? In what follows, Malebranche blunders from not attending to the kind of circular motion of which Aristotle is speaking; for it is concerning *natural* and not *artificial* circular motion, the latter of which may indeed be produced from two motions in a right line, whose swiftness is unequal according to a certain proportion. But the subject of circular motion we shall consider more fully when we come to examine Newton's theory of centripetal and contrifugal forces.

As all the objections of Malebranche to the philosophy of Aristotle, are equally invalid with those already adduced, I shall only select one or two more, and then dismiss him, as it would be tiresome to the reader, as well as to myself, to notice all his frivolities, and pursue him through all his rambling, inaccurate, and distorted conceptions.—" Aristotle farther supposes," says Malebranche, " that bodies are either simple or composed, and calls simple bodies, those that have the force of moving themselves, as fire, earth, &c. adding, that the compounded receive their motion from the compounding. But in that sense there are no simple bodies, since none have in themselves any principle of their motion. There are also none compound, since there are no simples of which they should be made; and so there would be no bodies at all. What fancy is it to define the simplicity of bodies by a power of moving themselves? What *distinct ideas* can be fixed to the words of simple and composed bodies, if the simple are only defined in relation to an imaginary moving force? But let us see what consequences he draws from these principles. The circular motion is simple. The heavens move circularly, and therefore their motion is simple. But simple motion can be ascribed only to a simple body, viz. to a body that moves of itself; and therefore the heavens are a simple body distinguished from the four elements, that move in right lines. 'Tis plain enough that such arguments contain nothing but false and absurd propositions." The whole of what is here objected by Malebranche depends on his mistaking the meaning of Aristotle, when he asserts " that simple bodies have a principle of motion according to nature;" for, as we have before observed, Aristotle himself says, that by a principle of motion in bodies according to nature, he means, " *that bodies are essentially moveable, or capable of being moved, according to place.*" And consequently all the objections of Malebranche are frivolous and sophistical.

If any thing however could be singular in so excentric and rambling a writer as Malebranche, it would be this, that in the above extract he makes use of the expression *distinct ideas*, though in his illustration upon the third chapter of the first book, p. 107, he says *that the word idea is equivocal.* His words are: " I say here that we have no idea of our mysteries [i. e. of the Christian mysteries,] as I said elsewhere we have no idea of our soul, because the idea we have of the latter is no clearer than those we have of the former; therefore the word idea is equivocal. Sometimes I have taken it for whatever represents to the mind any object, whether clearly, or confused and darkly; sometimes more generally, for whatever is the immediate object of the mind; sometimes likewise for that which represents things so clearly to the mind, that we may with a bare perception discover whether such or such modifications do belong to them. For this reason I have sometimes said we had an idea of the soul, and sometimes denied it; for it is difficult and often wearisome and ungrateful to observe a too rigorous exactness in one's expressions." From such a confession as this it is plain that no distinct meaning can be affixed to any thing Malebranche has written, because all his conceptions were equivocal; and I have no doubt that the reader is by this time fully convinced that he spoke feelingly when in his concluding remark he says, " that it is difficult and often wearisome and ungrateful to observe a too rigorous exactness in one's expressions."

Again, " the second reason, says Malebranche, of Aristotle to show that the heavens are a simple body distinguished from the four elements, supposes that there are two sorts of motions, one natural, and the other violent or against nature. But it is sufficiently plain to all those that judge of things by *clear and distinct ideas*, that bodies having not in themselves any such principle of their motion as Aristotle pretends, there can be no motion violent or against nature. It is indifferent to all bodies to be moved or not, either one way or another. But this philosopher, who judges of things by the impressions of the senses, imagines that those bodies, which by the laws of the communications of motions always place themselves in such or such a situation, in reference to others, do it of their own accord, and because it is most convenient for them, and best agrees with their nature." To the reader who has not abandoned common sense, and those common conceptions which are congenial to the human mind, it must appear very strange to find a man hardy enough to deny that there is such a thing as natural motion. For do not earthly masses tend to the centre of the earth; and is not this their tendency natural to them? If it is, then a *contrary* tendency is unnatural to them. Hence the motion of a stone downward is *natural* to it, but its motion upward is *violent*.

I trust the reader will deem the above extracts to be a sufficient specimen of the futility of Malebranche's objections against Aristotle, and of his profound ignorance of the real meaning of that philosopher. But, in short, all wonder at any incongruities and absurdities that may be found in Malebranche must cease, when we find him asking, in p. 111. "How can we be sure that those who go under the notion of mad men are really what they are taken for? May we not say they are reckoned crazed, because they have peculiar sentiments? For it is evident, that a man is not reckoned mad for having the sense of what is not, but only for having a sense of things quite contrary to that of others, whether their sense be true or false, right or wrong." And thus much for Malebranche, who from his distorted conceptions of things, his rambling and inaccurate manner of writing, and his unblushing effrontery, may be considered as the prototype and forerunner of most modern reviewers.

CHAPTER VII.

In the next place we shall find that the prince of modern philosophers, Sir Isaac Newton, was no less unacquainted with the writings of Aristotle than the before-mentioned authors; and that he also fabricated a new philosophy, without being an adept in the old. In his Lectiones Opticæ, therefore, p. 148, he attacks as follows Aristotle's

definition of colour: "Ait Aristoteles χρωμα δε εστι του διαφανους εν σωματι ωρισμενῳ περας. Quæ superficiei coloratæ potius quam coloris descriptio est. Illa enim dici potest extremitas perspicua in corpore terminato. At color plerumque videtur, ubi nullus talis datur extremitas, ut in iride et prismate, in vitris vel liquoribus perspicuis et aliquo colore leviter tinctis. In aquâ marinâ, quæ viridis plurimum apparet, qui tamen color non in extremitate aquæ, sed per totam ejus crassitiem, generatur; in aere, qui, licet maxime perspicuus et nullo corpore denso terminatus, serenâ tamen nocte cæruleus apparet; et in flammâ, quæ non minus perspicua est, et luci pervia, quam ipse aer. Sic cum humores oculi colore aliquo tinguntur, omnia, videntur eodem colore tincta, licet extremitas perspicui sit aliis coloribus prædita. Et cum solem nudis oculis modo aspexeris, luminosa omnia deinceps videntur rubra, et nigra plerumque apparent cærulea, qui color erit magis conspicuus, si clausis oculis te in locum aliquem tenebrosissimum statim conferas. Imo premendo oculum colores in tenebris excitare liceat; quis autem vocabit illos extremitatem perspicui?" Here Newton objects to Aristotle's definition of colour, viz. that *colour is the boundary or extremity of the diaphanous in a definite body*. For he says, that this is rather the description of a coloured superficies than of colour; since a coloured superficies may be said to be a diaphanous extremity in a terminated body. But, he adds, colour is for the most part seen where there is no such extremity, as in the rainbow and prism, in glass or liquors that are diaphanous and lightly tinged with some colour. In sea water which appears to be very green, and yet this colour is not in the extremity of the water, but is generated through the whole thickness of it. Thus also colour is seen in air, which though eminently transparent and terminated by no dense body, yet in a serene night is seen to be of an azure colour, and likewise in flame, which is not less transparent and pervious to the light than air itself," &c.

In order to show most satisfactorily the futility of Newton's objections, and the very superficial manner in which he had perused the works of Aristotle, it is necessary to observe, that according to Aristotle, the diaphanous is two-fold, one kind being definite, but the other indefinite, and that the former is that to which Aristotle alludes in the definition of colour cited by Newton from his treatise On Sense and Sensibles. Now the indefinite diaphanous is that which receives light internally through the whole of its substance, such as air and water, and all those bodies which are called transparent. But the definite diaphanous is that which receives light in its superfices only, as all mixed bodies which are not transparent, and which consist of the daphanous and the opaque, but on account of their opacity are not transparent, and on account of the diaphanous which they participate, receive light in their superficies alone, such as wood, a wall, gold, and the like. Such a diaphanous as this is assumed by Aristotle, in the above-cited definition of colour; but in his 2d book On the Soul, he defines the indefinite diaphanous as follows: εστι δη τι διαφανες. διαφανες δε λεγω, ο εστι μεν ορατον, ου καθ' αυτο δε ορατον, ως απλως ειπειν, αλλα δι' αλλοτριον χρωμα. τοιουτον δε εστιν αηρ, και υδωρ, και πολλα των στερεων· ου γαρ η υδωρ, ουδ' η αηρ, διαφανες, αλλ' οτι εστι φυσις ενυπαρχουσα η αυτη εν τουτοις αμφοτεροις, και εν τῳ αιδιῳ τῳ ανω σωματι.—i. e. "There is therefore something which is diaphanous. But I call the diaphanous that which is indeed visible, yet not in short of itself, but through colour which is not its own. Air, water, and many solids, are a thing of this kind. For neither water, so far as water, nor air, so far as air, is diaphanous, but they are so, because the same nature is inherent in both these, and in the perpetual body which is above." He also expressly mentions *the indefinite diaphanous* in the 3d chapter of his treatise On Sense and Sensibles, as follows: φαινεται δε και αηρ και υδωρ χρωματιζομενα. αλλ' εκει μεν δια το εν αοριστῳ ου την αυτην εγγυθεν και προσιουσι, και πορρωθεν εχει χροιαν. ουθ' ο αηρ, ουθ' η θαλαττα. εν δε τοις σωμασιν εαν μη το περιεχον ποιῃ το μεταβαλλειν, ωρισται και η φαντασια της χροας.—i. e. "Air also and water appear to be coloured. But there indeed because it happens in *the indefinite*, neither the air nor the sea appears to have the same colour to those that approach near, and to those who are at a distance. In bodies however [i. e. in opaque bodies,] unless the circumambient produces a change, the appearance of colour is also definite."

According to Aristotle, therefore, where there is the *indefinite diaphanous*, as in air and water, colour may be generated through the whole of such substances, but then it is not their own colour, but the colour of other things; but where there is the *definite diaphanous*, as in opaque bodies, which have a colour of their own, there the colour is in the superficies of the body. It is needless to observe that the objections of Newton arise from his not knowing this distinction which Aristotle makes between the *definite* and the *indefinite* diaphanous. Newton also, in his treatise On the System of the world[3], when he ridicules the hypothesis of solid spheres introduced by Eudoxus, Calippus, and Aristotle, and says they are now broken as things perfectly useless, and expelled from ether, evidently conceived that these spheres were hard and brittle like glass. Hence Addison, in his panegyric on Newton, applauds him for having broken through the chrystal boundaries in which Aristotle had confined the universe. Bonnycastle likewise, in his Introduction to Astronomy, p. 67, observes, "that solid orbs and epicycles were multiplied by the ancient astronomers posterior to Pythagoras to answer every appearance, till the universe had lost all its native beauty in their descriptions, and seemed again reduced to a chaos by their unhappy labours." He adds, "that Copernicus, seized with a daring enthusiasm, laid his hands on the cycles and chrystal orbs of Ptolemy, and dashed them to pieces. And that with the same noble *phrenzy*, he took the unwieldly earth, and sent her far from the centre of the system, to move round the sun with the rest of the planets."

Would any one suppose after all this, that neither Eudoxus, Calippus, Aristotle, nor Ptolemy, had the smallest conception of such spheres as Copernicus, Newton, and in short all the moderns, have supposed them to have introduced into the heavens? And yet nothing is more certain than that the orbs which these ancients adopted for the purpose of solving the celestial phænomena, were so far from being hard and brittle substances, that they were supposed to be of an etherial nature, and to consist of pure immaterial vivific light. To be convinced of this, the reader need only peruse the extracts from Aristotle's treatise On the Heavens, which we have given in the former part of this Dissertation. For in them Aristotle expressly says, "it is impossible that the body which is moved in a circle, or a celestial body, should have either gravity or levity. That such a body likewise is ingenerable and incorruptible, without increase, and unalterable, and suffers no change in quality." Hence, he adds, the first of bodies is perpetual, and has neither increase nor diminution, but undecaying, unchanged in quality, and impassive." He further adds: "The name too by which we have called it, appears to have been delivered in succession from the ancients, who had the same opinion about it, as far as to the present time. For it is necessary to think that the same opinions have reached us, not once or twice only, but an infinite number of times. Hence, in consequence of the first body being something different from earth and fire, air and water, they denominated the highest place ether, assigning it this appellation from always running for a perpetual time." This etherial substance, of which the heavens and the celestial spheres consist, was also called by the antients fire, but a fire of a very different nature from that which exists in the sublunary regions. Hence Proclus: "The celestial fire is not caustic but vivific, in the same manner as the natural heat which is in us. He also adds, that mortal animals live through a certain illumination from this light; and that all heaven consists of a fire of this kind, but that the stars have for the most part this element, and have likewise the summits of the other elements." *ου γαρ καυστικον το ουρανιον πυρ, αλλ᾽ ως αν εγωγε φαιην ζωοποιον, ως και το εν ημιν εμφυτον θερμον. και αυτος εν τοις περι γενεσεως ζωων, ειναι φησι τινα ελλαμψιν, ης παρουσης ζην των θνητων εκαστον. ο μεν ουν ολος ουρανος, εκ του τοιουτου πυρος εστι, τα δε αστρα, πλειστον μεν εχει τουτο το στοιχειον, εχει δε και των αλλων τας ακροτητας*[4].

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[3] Namque orbes solidi postea ab Eudoxo, Calippo, Aristotele introducti sunt; declinante indies philosophiâ primitus introductâ, et novis Græcorum commentis paulatim prævalentibus,——Eosdem (i. e. cometas) postea in regiones infra lunam necessario detrusit ista orbium solidorum hypothesis; et his iisdem vicissim per nuperas astronomorum observationes in cœlos lunâ superiores restitutis, confracti sunt illi orbes, et ex æthere deturbati.

Newton. De Mundi Systemate, p. 180.

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[4] Vid. Joann. Grammat. contra Procl. de Mundi Æternitate.

This divine body, on account of its superiority to sublunary natures, was called by Aristotle a fifth body, and was said by Plato to consist for the most part of fire; the characteristic of fire according to Plato being *visibility*, and of earth *tangibility*. The celestial spheres therefore being divine, immaterial bodies, have nothing of the density or gravity of this our earth, but are able to permeate each other without division, and to occupy the same place together; just like the illuminations emitted from several lamps, which pass through the whole of the same room at once, and pervade each other without confusion, divulsion, or any apparent distinction. Hence these spheres are similar to mathematical bodies, so far as they are immaterial, free from contrariety, and exempt from every passive quality; but are different from them so far as they are full of motion and life. But they are concealed from our sight through the tenuity and subtility of their nature, while on the contrary the fire of the planets which are carried in them, is visible through the solidity which it possesses. So that earth is more predominant in the planets than in the spheres; though each subsists for the most part according to the characteristic of vivific fire. Very elegantly therefore is it observed by Proclus (in Tim. p. 278.) "that the celestial spheres [in which the planets are carried] have a more attenuated and diaphanous, but the stars a more solid essence. That fire has every where dominion in the celestial regions, and that all heaven is characterized by its power. That the fire which is there is neither caustic, since this is not even the case with the first of the sublunary elements, which Aristotle is accustomed to call fiery-formed, nor corruptive of any thing, nor contrary to earth, but shines throughout with vivific heat, with illuminative power, with purity and transparent splendour." ει δει (lege δη) ταυτα ορθως λεγομεν, εικοτως αι μεν σφαιραι λεπτοτεραν εχουσιν και διαφανεστεραν ουσιαν, τα δε αστρα στερεωτεραν. πανταχου δε επικρατει το πυρ, και ο πας ουρανος κατα την χαρακτηριζεται δυναμιν. και ουτε καυστικον το εκει πυρ, (οπου γε ουδε το υπο σεληνην το πρωτιστον των ενταυθα στοιχειων, ο καλειν ειωθεν Αριστοτελης πυροειδες) ουτε φθαρτικον τινος, ουτε εναντιον προς την γην, αλλα θερμοτητι ζωογονῳ, και δυναμει φωτιστικῃ, και καθαροτητι και διαυγειᾳ διαλάμπον.

When Bonnycastle therefore represents Copernicus as influenced by a *noble phrenzy*, when he dashed the chrystal orbs of Ptolemy to pieces, he was certainly right in calling it a *phrenzy*; for none but a *madman* would attempt to break that which cannot be broken, and a body consisting of immaterial light must certainly be an infrangible substance; but it will not I trust be readily admitted that such a phrenzy is *noble*, except in the same way as that of a *plebeian lunatic*, who fancies himself to be a *king*.

The next modern I shall adduce, who has presumed to defame Aristotle without being thoroughly acquainted with his writings, is the Honorable Robert Boyle; a man who in other respects deserves no common portion of esteem and applause, for the purity of his manners, and the piety of his disposition. In this latter particular, indeed, he is an example worthy the imitation of every sincere lover of divinity. For it is recorded of him, that he never mentioned the name of God in conversation without a pause; so reverential were his conceptions of the divine essence. And it is deeply to be regretted, that a mind with such a pre-disposition had not, by a legitimate study of Plato and Aristotle, combined the light of science with the effusions of piety, and thus have had access to the adytum instead of standing in the vestibules of deity. This otherwise excellent man, therefore, observes of Aristotle as follows: " And I must now make bold to say, that Aristotle was not only a heathen, but was far enough from being one of the best heathen philosophers about God and divine things, there being several of the ancient philosophers, as Plato and Pythagoras (to name no others) whose discourses about the deity and his attributes, were much more sound, and less unsuitable to that infinitely perfect being and his actions, than were those of Aristotle; of whom the excellent Grotius somewhere judiciously observes, that his sentiments appeared much more favourable to religion, in his exoterical writings, where he was to keep fair with popular readers, than in his acroamatical, where he delivers his sense as a philosopher[1]." And again in another place; "For as Aristotle by introducing the opinion of the eternity of the world, did at least in almost all mens opinion, openly deny God the production of the world; so by ascribing the admirable works of God to what he calls nature, he tacitly denies him the government of the world[2]."

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[1] See Boyle's works, 4to. Vol. 6, p. 706.

From these extracts it appears, that Boyle had never read the Metaphysics of Aristotle; for if he had, he certainly would not have said that Aristotle ascribes the works of God to nature; since in the passage which we cited when we were speaking of Lord Bacon, the Stagirite expressly says, "that heaven and NATURE are suspended from the principle of things, who is the first mover, who moves as that which is beloved, and who is life and duration continued and eternal." Had Boyle indeed properly studied the works of Aristotle, he would have made the same eulogium on the whole, as he has represented Themistius in a dialogue making on a part of them. For this interlocutor there says: "That great favourite and interpreter of nature, Aristotle, who was, as his Organum witnesses, the greatest master of logic that ever lived, disclaimed the course taken by other petty philosophers (ancient and modern), who not attending to the coherence and consequence of their opinions, are more solicitous to make each particular opinion plausible independently upon the rest, than to frame them all so, as not only to be consistent together, but to support each other. For that great man, in his vast and comprehensive intellect, so framed each of his notions, that being curiously adapted into one system, they need not each of them any other defence than that which their mutual coherence gives them; as it is in an arch, where each single stone, which if severed from the rest would be perhaps defenceless, is sufficiently secured by the solidity and entireness of the whole fabric of which it is a part. How justly this may be applied to the present case, I could easily show you, if I were permitted to declare to you, how harmonious Aristotle's doctrine of the elements is with his other principles of philosophy; and how rationally he has deduced their number from that of the combinations of the four first qualities, from the kinds of simple motion belonging to simple bodies, and from I know not how many other principles and phænomena of nature, which so conspire with his doctrine of the elements, that they mutually strengthen and support each other[3]." And thus much for the illustrious but unfortunate Boyle; for unfortunate he certainly must be deemed, who with a mind so naturally well-disposed, mistook the dark and descending labyrinths of matter, for the arduous but luminous heights of genuine philosophy.

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[2] Vol. 5, p. 163.

Let us in the next place direct our attention to that celebrated modern, Locke, and we shall find him so far from being an adept in the writings of Aristotle, that he did not even understand his logic, though this ranks only as an introduction to the philosophy of the Stagirite. Any one is certainly justified in asserting this of Locke, when he finds him, in his Essay on Human Understanding, maintaining that syllogism is not the great instrument of reason. But I will extract what he says on this subject.

" If we will observe, says he, the actings of our own minds, we shall find that we reason best and clearest, when we only observe the connection of the proof, without reducing our thoughts to any rule of syllogism. And therefore we may take notice, that there are many men that reason exceeding clear and rightly, who know not how to make a syllogism.——All who have so far considered syllogism, as to see the reason why in three propositions laid together in one form, the conclusion will be certainly right, but in another not certainly so, I grant are certain of the conclusion they draw from the premises in the allowed modes and figures. But they who have not so far looked into those forms, are not sure by virtue of syllogism, that the conclusion certainly follows from the premises; they only take it to be so by an implicit faith in their teachers, and a confidence in those forms of argumentation; but this is still but believing, not being certain.—But God has not been so sparing to men to make them barely two-legged creatures, and left it to Aristotle to make them rational.—God has been more bountiful to mankind than so. He has given them a mind that can reason, without being instructed in methods of syllogizing.—I say not this any way to lessen Aristotle, whom I look on as one of the greatest men among the ancients; whose large views, acuteness and penetration of thought, and strength of judgment, few have equalled: and who in this very invention of forms of argumentation, wherein the conclusion may be shown to be rightly inferred, did great service against those who were not ashamed to deny any thing. And I readily own that all right reasoning may be reduced to his forms of syllogism. But yet I think I may truly say, without any diminution to him, that they are not the only, nor the best way of reasoning, for the leading of those into truth who are willing to find it, and desire to make the best use they may of their reason for the attainment of knowledge[4]."

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[3] Vol. 1. p. 469.

This passage may surely be considered as one of the most remarkable for its absurdity that ever was written by a rational being. For can any thing be more obvious to one who is at all conversant with logic than this, that all reasoning is a syllogistic process, which process is either latent or apparent? To say, therefore, that God has given men a mind that can reason, without being instructed in methods of syllogizing, is just as absurd as if it should be said that God has made all men archers without being instructed in the use of the bow. For as all men are capable of discharging an arrow from a bow, and may frequently though unskilled in archery hit the mark at which they aim, so all men can reason though uninstructed in syllogism, and frequently though thus ignorant reason rightly, but the rectitude in both these instances is accidental; since he who is unskilled in the use of the bow cannot be certain that he shall hit the mark, nor can he who is uninstructed in syllogism be certain that he reasons rightly. The absurdity indeed of Locke's position is so great, that he contradicts himself in maintaining it. For he says, "I readily own that all right reasoning may be reduced to Aristotle's forms of syllogism;" and yet he immediately adds, "But I think I may truly say, without any diminution to him, that they are not the only nor the best way of reasoning, for the leading of those into truth who are willing to find it, and desire to make the best use they may of their reason for the attainment of knowledge." Now if all right reasoning may be reduced to Aristotle's forms of syllogism, the best way of reasoning must be according to those forms. For the best way of reasoning is surely that which leads to right reasoning, and right reasoning is reducible to the syllogistic forms invented by Aristotle.

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[4] See his Essay, 4to edit. p. 423, 424.

Besides, there can be no demonstration unless that syllogism is employed, the properties of which Aristotle has so beautifully unfolded in his Posterior Analytics. For having enumerated the three conditions of true science; viz. first, that the cause of the thing must be known, or, in other words, that the middle term of the demonstration must be the cause of the conclusion; secondly, that this cause must be compared with the effect, so that we may know it to be the cause of the conclusion; and thirdly, that this conclusion must have a necessary subsistence, he observes as follows: Ει τοινυν εστι το επιστασθαι, οιον εθεμεν· αναγκη και την αποδεικτικην επιστημην εξ αληθων τ' ειναι, και πρωτων και αμεσων, και γνωριμωτερων, προτερων, και αιτιων του συμπερασματος. ουτως γαρ εσονται και αι αρχαι οικειαι του και δεικνυμενου. συλλογισμος μεν γαρ εσται και ανευ τουτων· αποδειξις δε ουκ εσται· ου γαρ ποιησει επιστημην. αληθη μεν ουν δει ειναι, οτι ουκ εστι το μη ον επιστασθαι: οιον οτι η διαμετρος συμμετρος. εκ πρωτων δ' αναποδεικτων, οτι ουκ επιστησεται μη εχων αποδειξιν αυτων. το γαρ επιστασθαι ων αποδειξις εστι, μη κατα συμβεβηκος, το εχειν αποδειξιν εστιν. αιτια τε, και γνωριμωτερα δει ειναι, και πρατερα. αιτια μεν, οτι τοτε επισταμεθα, οταν την αιτιαν ειδωμεν. και προτερα, ειπερ αιτια. και προγινωσκομενα ου μονον τον ετερον τροπον τῳ ξυνιεναι, αλλα και τῳ ειδεναι οτι εστι. προτερα δ' εστι και γνωριμωτερα διχως. ου γαρ ταυτον, προτερον τῃ φυσει, και προς ημας προτερον. ουδε γνωριμωτερον, και ημιν γνωριμωτερον. λεγω δε προς ημας μεν προτερα και γνωριμωτερα τα εγγυτερον της αισθησεως· απλως δε προτερα και γνωριμωτερα τα πορρωτερον. εστι δε πορρωτατω μεν, τα καθολου μαλιστα. εγγυτατω δε, τα καθεκαστα. και αντικειται ταυτ' αλληλοις.—i. e. "If then science is such as we have established it to be, it is also necessary that demonstrative science should consist of things true, first, immediate, more known than, prior to, and the causes of, the conclusion: for thus they will be the proper principles of that which is demonstrated. *For there may be a syllogism indeed without these conditions; but there will not be demonstration, since such a syllogism will not produce science.* It is necessary, therefore, that the things from which demonstrative science consists should be *true*, because that which is not cannot be *scientifically* known; as, for instance, that the diameter of a square is commensurable with its side. It is also necessary that they should be from things *first and indemonstrable*, because they will not be *scientifically* known without demonstration. For to know, scientifically, things of which there is demonstration, and this not from accident, is to possess demonstration. It is likewise necessary that they should be *the causes of, more known than*, and *prior* to the conclusion. *Causes*, indeed, because we then know scientifically, when we know the cause: and *prior* because they are the causes. They are also *previously known*, not only from our understanding what they signify, but from our knowing that they are true. But things prior and more known subsist in a twofold respect. For that which is prior to nature is not the same with that which is prior to us; nor is that which is more known to nature, the same with that which is more known to us. By things prior and more known to us, I mean such as are nearer to sense; but *things simply prior and more known are such as are more remote from sense.* And *things more remote from sense are such as are especially universal;* but such as are most near to it are particulars, and these are opposed to each other."

If, therefore, it is impossible for demonstrative science to subsist without these conditions, and no scientific man will deny that it is impossible, how can any one be certain that his reason is demonstrative, if he is unacquainted with the above-mentioned properties of the demonstrative syllogism? For where the reasoning is not scientific the conclusion may happen to be true, though the premises are false, as Aristotle has shown in many instances in his Prior Analytics; but then such premises are not the causes of the conclusions, nor the proper principles of that which is apparently demonstrated. Thus he who syllogizes as follows: Every stone is an animal: Every man is a stone; ergo, Every man is an animal, asserts indeed in the conclusion what is true; but then this syllogism does not produce science, because both the major and the minor propositions are *false*, and are not the *proper principles* of the conclusions. For they can only be admitted as principles by him who admits what is false to be true; since as Aristotle justly observes, *that which is not cannot be scientifically known*. A man also may happen to reason scientifically without knowing the properties of the demonstrative syllogism, but then he is not certain that his reasoning is scientific; and to say with Locke, that syllogism is not the great instrument of reason, because many men reason exceedingly clear and rightly, who know not how to make a syllogism, is just as if it should be said that sight is not necessary in walking, because many blind men in travelling happen to arrive at the end of their journey in the right road. And from all this I think it is most indisputably evident, that Locke had by no means studied the logic of Aristotle, but was profoundly ignorant of its true nature and use.

This want of knowledge in the moderns of the writings of Aristotle, and consequent defamation of them, continues even to the present time. For Bonnycastle, in his Introduction to Astronomy, p. 23, says, "That Aristotle, who was the great oracle of antiquity, gave the earth the form of a timbrel;" whereas Aristotle confutes those ancients who thought it had this form, and also demonstrates that it is spherical [5]. Of the truth of what I have asserted the following extracts are a proof:

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[5] Thus too Dr. Hutton, in the account he gives of Manilius in his Mathematical Dictionary, says, "that Manilius defends the fluidity of the heavens against the hypothesis of Aristotle;" though, as we have before shown, the heavens, according to Aristotle, are of an etherial nature, consisting of matter, which, when compared with any thing sublunary, may be said to be immaterial. The lines in Manilius, to which I suppose the Doctor alludes, are the following:

> Cum suspensus eat Phœbus; cursumque reflectat
> Huc illuc, agiles et servet in æthere metas.——Lib. 1, v. 17.

In which the poet represents the sun as moving freely through ether.

But the Doctor derives what he here says from Creech, who makes the same observation, and in the very same words, in the Preface (p. 66) to his translation of Manilius. By which it is evident that neither Creech nor Hutton had read Aristotle.

In the thirteenth chapter then of the second book of his treatise On the Heavens, Aristotle says, "That to some of the ancients the earth appeared to be broad, and to have the form of a drum. Of the truth of this opinion they urge as an argument, that when the sun rises and sets, he appears to make a rectilinear, and not a circular occultation, from the earth; though it would be requisite (say they) if the earth were spherical, that the abscission should be circular. These do not attend to the distance of the sun from the earth, and the magnitude of the circumference, and do not consider that in apparent small circles, a circumference at a distance appears to be a right line." τοις δε πλατεια, και το σχημα τυμπανοειδης· ποιουνται δε τεκμηριον, οτι δυνων και ανατελλων ο ηλιος, ευθειαν, αλλ' ου περιφερη την αποκρυψιν φαινεται ποιουμενος υπο της γης· ως δεον ειπερ ην σφαιροειδης, περιφερη γινεσθαι και την αποτομην, ου προσλογιζομενοι το, τε αποστημα του ηλιου προς την γην, και το της περιφειας μεγεθος, ως εν τοις φαινομενοις μικροις κυκλοις ευθεια φαινεται πορρωθεν. But, that the earth is spherical, Aristotle demonstrates in the fifteenth chapter of the above-mentioned treatise, employing the whole of the chapter for this purpose, the beginning of which is as follow: σχημα δε εχειν σφαιροειδες αναγκαιον αυτην· εκαστον γαρ των μοριων βαρος εχει μεχρι προς το μεσον· και το ελαττον υπο του μειζονος ωθουμενον ουχ οιον τε κυμαινειν, αλλα συμπιεζεσθαι μαλλον, και συγχωρειν ετερον ετερω, εως αν ελθη επι το μεσον.—i. e. "The earth also has *necessarily* a spherical figure; for each of its parts gravitates as far as to the middle; and a less when impelled by a greater part cannot fluctuate, but is rather compressed, and the one yields to the other till they arrive at the middle[6]."

And thus I have shown, and I trust satisfactorily, that the greatest of the moderns have defamed the philosophy of Aristotle without understanding it, have ascribed to him tenets which he never maintained, have decided on the merits of the whole from a very superficial inspection of a part of his works, and, as the colophon of lawless innovation, have promulgated a new philosophy before they were adepts in the old. The moderns of less celebrity, who, actuated by the same lawless ambition and desire of novelty as those I have already noticed, have presumed to attack the Stagirite, though they had not even a dreaming perception of his profundity, I shall pass by in silence, and resign them to that oblivion to which they are rapidly tending. For the opposition which both the latter and the former of these men have made to the philosophy of Aristotle, is just as idle as are the incursions of the sea against some lofty rock, which swelling on high breaks its billows, and exhibits no vestige of its rage, though for so many ages it has been lashed by its waves.

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[6] In the course of this chapter, also, Aristotle makes use of the very same argument to prove that the earth is spherical, which is employed for this purpose by the moderns. For he says, "If the earth were not spherical, the eclipses of the moon would not have such segments as they now have. For now the moon, in her monthly configurations, receives all divisions; viz. the right-lined, the curved on both sides, and the hollow. But in eclipses the bounding line is always convex. Hence, since the moon is eclipsed through the interposition of the earth, the periphery of the earth which is of a spherical figure will be the cause of this." ουτε γαρ αι της σεληνης εκλειψεις τοιαυτας αν ειχον τας αποτομας· νυν μεν γαρ εν τοις κατα μηνα σχηματισμοις, πασας λαμβανει τας διαιρεσεις. και γαρ ευθεια γινεται, και αμφικυρτος, και κοιλη. περι δε τας εκλειψεις, αει κυρτην εχει την διοριζουσαν γραμμην. ωστ' επειπερ εκλειπει δια την της γης επιπροσθησιν, η της γης αν ειη περιφερεια του σχηματος αιτια σφαιροειδης ουσα.

A

DISSERTATION

ON THE

PHILOSOPHY OF ARISTOTLE.

BOOK IV.

CHAPTER I.

In the Second Book of this Dissertation, I have shown that, according to Aristotle, the sea is the *wholeness* or perpetual principle (ὁλοτης) of water. But as this dogma of Aristotle is derived from the doctrine of his master Plato, that all the wholes of which the universe consists have a never-failing subsistence, and are prior to, as being the causes of the parts which are contained in them, I shall from its great importance endeavour to develop this theory; as it will in no small degree contribute to the design of this Book, which is to show the fallacy and nothingness of modern philosophy. For this doctrine does not appear to have been known to any physiologist since the destruction of the schools of the Greek philosophers: and the errors of those who have attempted to philosophize since that time, have in a great measure been owing to a complete ignorance of it.

We say then that man is generated from man, and from every thing its like. After what manner, therefore, are they generated? For it will not be said that the generation of these is from chance; since neither nature nor divinity makes any thing in vain. But if the generation of men is not from chance, whence is it? You will say, it is evidently from seed. Let it then be admitted that man is from seed; but seed possesses productive powers in capacity, and not in energy. For since it is a body, it is not naturally adapted to possess productive powers impartibly and in energy: for every where a subsistence in energy precedes a subsistence in capacity; since being imperfect, it requires the assistance of something else endued with a perfective power. This something else you will say is the nature of the mother; for this perfects and fashions the offspring by its productive powers. For the apparent form of the mother does not make the infant, but nature, which is an incorporeal power and the principle of motion. If, therefore, nature changes the productive powers of seed from capacity to a subsistence in energy, nature must herself possess these productive powers in energy. Hence, being irrational and without imagination, she is at the same time the cause of physical reasons. As the nature of man, therefore, contains human productive powers, does not also nature in a lion contain those of the lion; as, for instance, the reasons or productive powers of the head, the hair, the feet, and the other parts of the lion? Or, whence, on shedding a tooth, does another grow in its place, unless from an inherent power which is able to make the teeth? How, likewise, does it at the same time make bone and flesh, and each of the other parts? For the same thing energizing according to the same, would not be able to fashion such a variety of organization. But does not nature in plants also possess productive powers as well as in animals? or shall we not say that, in these likewise the order of generation and the lives of the plants evince that they are perfected from orderly causes? It is evident, therefore, from the same reasoning, that the natures of these also comprehend the apparent productive powers. Let us then ascend from these to the one nature of the earth, which generates whatever breathes and creeps on its surface, and which by a much greater priority contains the productive powers of plants and animals. Or whence the generation of things from putrefaction? Whence is it that different kinds of plants grow in the same place, without human care and attention? Is it not evident that it is from the *whole nature* of the earth, containing the productive powers of all these in herself? And thus proceeding, we shall find that the nature in each of the elements and celestial spheres comprehends the productive powers of the animals which it contains. And if from the celestial spheres we ascend to the nature of the universe itself, we may also enquire respecting this, whether it contains forms or not, and we shall be compelled to confess, that in this also the productive and motive powers of all things are contained; for whatever is perfected from inferior subsists in a more excellent and perfect manner from more universal natures. The nature of the universe, therefore, being the mother of all things, comprehends the productive powers of all things; for, otherwise, it would be absurd that art, imitating natural reasons, should operate according to productive principles, but that nature herself should energise without reasons, and without inward measures. But, if nature contains productive principles, it is necessary that there should be another cause prior to nature, which is comprehensive of forms; for nature verging to bodies energises in them, just as if we should conceive an artist verging to pieces of timber, and inwardly, by various operations, reducing them to a certain form. For thus nature, merged together with and dwelling in corporeal masses, inspires them with her productive powers and with motion; since things which are moved by others require a cause of this kind, a cause which is properly irrational indeed, that it may not depart from bodies, which cannot subsist without a cause continually residing with them, but containing the productive powers of bodies, that it may be able to preserve all things in their proper boundaries, and move every thing in a convenient manner. Nature, therefore, belongs to other things, being merged in, or co-ordinated with, bodies. But it is requisite that the most principal and proper cause should be exempt from its productions: for by how much more the maker is exempt from the thing made, by so much the more perfectly and purely will he make. And, in short, if nature is irrational, it requires a leader. There is, therefore, something prior to nature as a whole which contains productive powers, from which it is requisite that every thing in the world should be suspended, and which is a whole superior to and comprehending in itself all mundane wholes.

Moreover, whole, according to Plato, has a three-fold subsistence; for it is either prior to parts[1], or it is composed of parts, or it subsists in

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[1] In the preface to my treatise entitled "The Elements of the true Arithmetic of Infinites," and which is annexed to Aristotle's treatise "On Indivisible Lines," in Vol. VII. of my translation of his works, I observe that, "As one of the principal discoveries in this treatise is, *that in every infinite series of terms, whether integral or fractional, the last term (i. e. either the greatest or the least term) multiplied by the number of terms, is equal to the sum of the series*; I rejoice to find as the result of this discovery, that it affords a most splendid instance of the absurdity which may attend reasoning by induction from parts to wholes, or from wholes to parts, when the wholes are themselves infinite;" viz. when they are infinite in power. These infinite series, therefore, are beautiful images of the wholes that are prior to parts. Though I have demonstrated, however, that this admirable property extends to all kinds of infinite series, and I defy any mathematician to prove that I have not, yet because it militates against the doctrine of fluxions, modern mathematicians, though they have not attempted to confute, are unwilling to admit it. One of the greatest mathematicians of the age, on inspecting the sheet (while the treatise was printing) which contains this discovery, said to me, that he saw nothing to object to in it; but since its publication he has preserved a profound silence on the subject. The same great mathematician also told me, "that he never could understand the principles on which the doctrine of fluxions is founded, and that he did not think they were to be understood; but that the conclusions deduced from those principles happened some how or other to be true." He added, "that the Analysist of Bishop Berkeley (a work written in opposition to the doctrine of fluxions), had never been properly answered."

Such is the deplorable state of literature at present, in consequence of becoming a regular system of traffic, that all liberal discussion is at an end. Authors have become tradesmen. Books are manufactured at a certain price per sheet, and when manufactured are circulated through the agency of booksellers, and their instruments the Reviewers. Hence it is a common expression with booksellers, that such or such a publication *has got into the market*, or *that the market is glutted with it*. Unless a bookseller, therefore, is interested in a publication, however great the merit of it may be, it stands no chance of being speedily known; and it must trust, for the gradual development of its intrinsic worth, to time and a concurrence of fortunate circumstances. This is particularly the case if a work happens to oppose doctrines that, by having *got into the market*, with great in a part. For we either contemplate the form of every thing in its cause, and affirm that the whole which subsists in its cause is prior to parts,

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great success, become the sources of considerable gain to certain booksellers and authors; for then the authors, being alarmed, inform their booksellers, and both these, that their pockets may not be injured, order their journeymen the Reviewers to speak ill of the work.

This being the case, there is no probability that any discovery, however important it may be, which is hostile to the doctrines of the existing book-makers, will be immediately noticed, unless it is supported by great power and great wealth; or, if it is noticed, it will be in order to decry it by all the arts the malignant cunning and sophistry of a little grovelling soul can devise.

The discovery to which I allude, depends on admitting that the number of terms in an infinite series cannot be greater than $1+1+1+1$, &c. ad infinitum, viz. than $\frac{1}{1-1}$. For though the terms of one infinite series may be greater than the terms of another, yet the *number* of terms must evidently be the same in each. My 8th proposition, therefore, is as follows: "In every series of terms in arithmetical or geometrical progression, or in any progression in which the terms mutually exceed each other, the last term is equal to the first term, added to the second term, diminished by the first; added to the third term, diminished by the second; added to the fourth term, diminished by the third; and so on. And if the number of terms be infinite, the last term is equal to the series multiplied by $1-1$."

Demonstration.

"Let the terms, whatever the series may be, be represented by a, b, c, d, e, then $a+b-a+c-b+d-c+e-d=e$.

$$\begin{array}{l} a \\ +b-a \\ +c-b \\ +d-c \\ +e-d \\ \hline =e \end{array}$$

But if the number of terms be infinite, viz. if the series be $a+b+c+d+e+f+g$, &c. ad infin. then this series multiplied by $1-1$ will be $=a+b-a+c-b+d-c+e-d+f-e+g-f$, &c. Q. E. D.

In consequence of this the leading propositions in Dr. Wallis's Arithmetic of Infinites are false. Thus in the infinite series $0+1+2+3+4$, &c. the last or greatest term is $0+1+1+1+1$, &c. and the number of terms is $1+1+1+1+1$, &c. and $0+1+1+1$, &c. and multiplied by $1+1+1+1+1$, &c. produces $0+1+2+3+4+5$, &c. Thus too in the series $0+1+4+9+16+25$, &c. the last term is $0+1+3+5+7+9+11$, &c. and the number of terms is $1+1+1+1$, &c. and the last term multiplied by the number of terms is equal to $0+1+4+9+16$, &c. Thus again, in the series $0+1+8+27+64+125$, &c.; the last term is $0+1+7+19+37+61$, &c. and the number of terms is $1+1+1+1+1$, &c. and the last term multiplied by the number parts, or we contemplate the form of a thing in the parts which participate of that form. And this in a two-fold respect. For the form is either

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number of terms produces 0+1+8+27+64+125, &c. And so in other instances which are enumerated in Prop. 3.Hence as I infer in corol. 4 to prop. 8. "In every infinite series, whether fractional or integral, the terms of which have an uninterrupted continuity, the last term multiplied by the number of terms, will be equal to the sum of the series." Now if this be admitted to be true, and I defy any mathematician to demonstrate that it is not, the following propositions of Dr. Wallis, are evidently false.

"In the arithmetical series 0+1+2+3+4, &c. if the last term be multiplied into the number of terms, the product will be *double* the sum of all the series."

"In the series of squares 0+1+4+9+16, &c. infinitely continued, the last term being multiplied into the number of terms, will be *triple*, to the sum of all the series."

"In the series of cubes 0+1+8+27+64+125, &c. infinitely continued, the last term being multiplied into the number of terms, will be *quadruple*, the sum of all the series."

In the 16th Proposition, also, I have demonstrated the cause of the error in the leading propositions of Dr. Wallis's Arithmetic of Infinites, as follows:

"To demonstrate this, I shall take the instance adduced by him in square numbers, as it will easily be seen that the absurdity with which this is attended will also attend all the other examples.

"His proposition is as follows: If a series of squares whose sides or roots are in arithmetical progression, beginning with a cypher, be infinitely continued, the last term being multiplied into the number of terms, will be triple the sum of the whole series. That is according to Dr. Wallis's pretended proof by induction,

$$\left\{\frac{0+1+4}{4+4+4}=\frac{5}{12}=\frac{1}{3}+\frac{1}{12}\right.$$

$$\left\{\frac{0+1+4+9}{9+9+9+9}=\frac{14}{36}=\frac{7}{18}=\frac{1}{3}+\frac{1}{18}\right.$$

$$\left\{\frac{0+1+4+9+16}{16+16+16+16+16}=\frac{30}{80}+\frac{3}{8}=\frac{9}{24}=\frac{1}{3}+\frac{1}{24},\text{ \&c.}\right.$$

"In the first of these instances, it is evident that 5, the sum of the series, exceeds one-third of the last or greatest term, so many times repeated as is the number of terms in the series by 1, i. e. by $\frac{3}{12}$ of 4+4+4. In the second instance, 14, the sum of the series exceeds one-third of 36 by 2, which is equal to $\frac{1}{18}$ of 9+9+9+9. And in the third instance, 30 exceeds the one-third of 80 by the $\frac{1}{24}$ part of 16 + 16 + 16 + 16 + 16, which is equal to $3\frac{1}{3}$. Hence, Dr. Wallis concludes, that since the excess above $\frac{1}{3}$ continually decreases, if the series be infinitely continued, the excess will then become infinitely small, viz. in effect nothing.

"It is somewhat strange that so great a mathematician as Dr. Wallis undoubtedly was, should not have perceived that the $\frac{1}{12}$ of 4 + 4 + 4, the $\frac{1}{18}$ of 9 + 9 + 9 +9, and the $\frac{1}{24}$ of 16 + 16 + 16 + 16 + 16, viz. 1, 2, $3\frac{1}{3}$ are continually increasing quotients, though $\frac{1}{12}$, $\frac{1}{18}$, and $\frac{1}{24}$ continually either collectively in all the parts; and this is a whole composed of parts, any one of which, when absent, diminishes the whole itself. Or it is in each of the parts; so that every part according to participation becomes a whole, i. e. a partial whole. The whole composed of parts subsists on account of essence; but the whole which is prior to parts has a causal subsistence; and that which subsists in a part is according to participation. For this is a whole according to ultimate subjection, so far as it imitates the whole which consists from parts; since it is not any part indifferently, but that which is capable of being assimilated to a whole, whose parts also are wholes.

It is necessary, therefore, to the generation and corruption of the

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ally decrease, and consequently that the sum of the series, when continued to infinity, will exceed $\frac{1}{3}$ of an infinite number of terms equal to the greatest, by a number infinitely great. Hence, the excess of the sum of the series above $\frac{1}{3}$ of the aggregate of an infinite number of terms equal to the greatest, when the series is infinitely continued, will be an infinite number; and this excess, as we have before shown, added to $\frac{1}{3}$ of the said aggregate, is exactly equal to the sum of the series.

"In finite terms, therefore, such decreasing fractions as $\frac{1}{12}$, $\frac{1}{18}$, $\frac{1}{24}$, &c. being considered as parts of unity, at length end in a fraction, which is an infinitesimal; but in such infinite series as the above, they are no longer to be considered as parts of unity, and they end in a fraction, which is indicative of an infinite series of whole numbers."

These mathematicians also are unwilling to admit the first proposition of my Elements of the true Arithmetic of Infinites, viz. that $1-1$, while it remains in this form of 1 connected with minus 1, and no actual substraction is made of 1 from 1, is an infinitesimal, or infinitely small part of the fraction, $\frac{1}{1+1}$. In the hope, however, that what I am now writing will be perused by some *liberal* mathematician, the following demonstration of this proposition is added, as it appears to me to be stronger than that which I have given in the above-mentioned treatise, though I consider that as irrefragable.

If 1 be divided by $1-1$ the quotient is universally admitted to be $1+1+1+1$, &c. ad infin. and consequently if 1 be divided by $1+1+1+1$, &c. the quotient is $1-1$. For in division the dividend divided by the quotient gives the divisor. That is, $\frac{1}{1+1+1+1+1, \&c.} = 1-1$. Let, therefore, $\frac{1}{1+1+1+1, \&c.}$ be multiplied by any infinite series, for instance, by $3+3+3+3$, &c. and the product will be $\frac{3+3+3+3+3, \&c.}{1+1+1+1+1, \&c.} = 3$, which most clearly proves that $1-1$, while it remains in the form of $1-1$, is not the same as 0.

parts in the universe, that they should proceed from wholes, which are prior to, as being the causes of them, and to which these parts finally return. Hence, the world is called by Plato, in the Timæus, *a whole of wholes*, as containing in itself the starry spheres, and the spheres of air, water, and earth, each of which is a whole comprehended in the great whole of the world. For after intellect which eternally abides the same both in essence and energy, and soul, which is eternally the same in essence, but mutable in energy, that nature must succeed, which is perpetually mutable both in essence and energy, and which consequently subsists in a perpetual dispersion of temporal extension, and is co-extended with time. Such a body, therefore, is very properly said to be generated, at the same time that this generation is perpetual. This body too, on account of the perpetuity of its duration, though this is nothing more than a flowing eternity, may be very properly called *a whole with a total subsistence.* For every thing endued with a total subsistence is perpetual; and this may be truly asserted of the body of the world, when we consider that this body is co-extended with the infinite progressions of time. Hence, this divine or celestial body may be properly called *a whole with a total subsistence,* just as the limb of an animal is *a part with a partial subsistence.* But, between these, two media are necessarily required, viz. *a part with a total, and a whole with a partial subsistence.* The parts, therefore, with *a total subsistence* which the world contains, are no other than the celestial spheres, which are consequently perpetual and divine, after the same manner as the whole body of the world, together with the spheres of the elements; and the *wholes with a partial subsistence,* are no other than individuals, such as a man, a horse, and the like.

As the world too, considered as one great comprehending whole, is called by Plato a divine animal, so likewise every whole which it contains is a world, possessing a unity proceeding from the ineffable principle of things, a divine intellect, a divine soul, and a deified body. Hence, each of these wholes is the producing cause of all the multitude it contains, and on this account, as we have before observed, is said to be a whole prior to parts; because, considered as possessing an eternal form, which holds all its parts together, and gives to the whole perpetuity of subsistence, it is not indigent of such parts to the perfection of its being. That these wholes which rank thus high in the universe are animated, must follow by a geometrical necessity. For, as Theophrastus well observes, wholes would possess less authority than parts, and things eternal than such as are corruptible if deprived of the possession of soul.

In the fabricator of the universe, therefore, who is an incorporeal whole of wholes, or, in the language of the Pythagoreans, a monad of monads, the world subsists with all its wholes, these wholes or spheres being parts of the world as giving completion to it. But when each of us is said to be a part of the world, it is not that the universe, so far as it is the universe, receives its completion through us; for it would not be imperfect from the destruction of some individual of our species; but we are parts because we are co-extended with the parts of the universe that rank as wholes, are governed by the universe in conjunction with all other things, and are, in short, in the world as in one mighty animal, and become parts of it, not so far as it exists, but so far as it is *prolific*.

The man of a truly philosophic genius will immediately see how infinitely superior this theory is to the hypothesis of the experimentalists, who, from a minute and uninterrupted attention to parts, know nothing of the *great wholes* in the universe, and the incorporeal powers they contain, and who, in order to support their dogma, that every animal and plant are immediately produced from seed, are reduced to the necessity of supposing that the air is replete with an immense number of all kinds of seeds, which are dispersed everywhere without order, and which become efficacious only when they meet with a proper recipient. For such an hypothesis directly subverts that most important axiom, and which was held in such veneration by the *pious* philosophers of antiquity, that *God and nature do nothing in vain*; since it is evident that millions of these seeds must perish, in consequence of not meeting with a fit recipient. But experimental enquiries necessarily lead to

atheism,

atheism, when they are not made subservient to the intellectual philosophy.

Ray, in his treatise on the Wisdom of God in the Creation, exhibits a very remarkable proof of the truth of what is here asserted; for he appears to have had no conception whatever of the agency of nature, considered as an incorporeal power operating in matter, in subordination to the cause of all things; and from the want of such a conception, he entirely rejects spontaneous generation. For in p. 73, &c. he thus writes: " Indeed, a spontaneous generation of animals and plants upon due examination will be found to be nothing less than a creation of them. For after the matter was made, and the sea and dry land separated, how is the creation of plants and animals described, but by a commanding, that is, effectually causing the waters and earth to produce their several kinds without any seed? Now creation being the work of omnipotency, and incommunicable to any creature, it must be beyond the power of nature or natural agents to produce things after that manner. And as for God Almighty, he is said to have rested from his work of creation after the seventh day. But if there be any spontaneous generation, there was nothing done at the creation but what is daily done; for the earth and water produced animals then without seed, and so they do still." He adds, " such a spontaneous generation seems to me to be nothing less than a creation. For, creation being not only a production of a thing out of nothing, but also out of indisposed matter, as may be clearly inferred from the scripture, and is agreed by all divines; this spontaneous generation being such a production, wherein does it differ from creation? Or what did God Almighty do at the first creation of animals and plants, more than what (if this be true) we see every day done? To me, I must confess, it seems almost demonstrable, that whatever agent can introduce a form into indisposed matter, or dispose the matter in an instant, must be superior te any natural one, not to say omnipotent." Prior to this, however, he confesses that there is one instance which militates against his opinion. " No instance against this opinion (says he) doth so much puzzle me as worms bred in the intestines of man and other animals. But seeing the round worms do manifestly generate, and probably the other kinds too, it is likely they come originally from seed, which how it was brought into the guts may afterwards possibly be discovered."

The reader, who is at all conversant with the intellectual philosophy of Plato and Aristotle, will easily see that what I have just cited is the result of a very profound ignorance of the following most important truths: That the cause of the universe is an *eternally* energizing Being, and that he does not, therefore, operate at one time, and rest from his work at another, nor begin at a certain time to energize, having been prior to this quiescent; for this is to suppose him a being resembling man. That there are many incorporeal powers proceeding from this cause similar to, though not the same with it, and co-operating with it in the fabrication of the universe. That nature is the last of these mighty incorporeal powers. And that the universe ever has been, is, and will be,, incessantly passing into existence, through the energy of these powers in conjunction with the energy of their great eternal cause. Poor Ray, for want of this knowledge was reduced to the miserable shift of asserting, *that it is likely the worms in the intestines of animals came originally from seed, but that how it was brought into the guts may afterwards possibly be discovered.* Certainly *Ray* was on this subject *rayless.*

CHAPTER II.

In demonstrating the futility and falsity of the philosophy which has been substituted by the moderns for that of Aristotle, I shall principally confine myself to an examination of some of the principal tenets of Bacon, Newton, and Locke; the first of these being celebrated for making experiment the criterion of truth; the second being renowned for his physical astronomy as it is called; and the third for his theory of the human mind. I confine myself principally to these three, because

cause they are I believe, universally acknowledged to have been the founders of modern philosophy.

My remarks also on the first of these, Lord Bacon, will not extend beyond his Novum Organum, as this is the most celebrated of his productions, and may be said to contain as it were the elements of his philosophy.

In the preface, therefore, to this work which was written by its author for the purpose of subverting the Organon or Logical treatises of Aristotle, he observes, that the edifice of this universe is in its structure, as it were, a labyrinth to the human intellect that contemplates it. That in this labyrinth there are many ambiguous ways, fallacious similitudes of things and signs, oblique and complicated windings and knots of natures, every where presenting themselves to the view; and that the journey is perpetually to be made, under the uncertain light of sense, sometimes shining and sometimes hiding itself, through the woods of experience and particulars. " Ædificium autem hujus universi, structura sua, intellectui humano contemplanti instar labyrinthi est; ubi tot ambigua viarum, tam fallaces rerum et signorum similitudines, tam obliquæ et implexæ Naturarum spiræ et nodi, undequaque se ostendunt; iter autem, sub incerto sensus lumine, interdum affulgente, interdum se condente, per experientiæ et rerum particularium sylvas perpetuo faciendum est." A journey through a labyrinth so intricate and difficult as that which Lord Bacon has described, and in which the traveller has nothing to guide his steps but an uncertain light, sometimes shining, and sometimes concealed, is not likely to be very successful. And I think it may be fairly concluded, that it is more probable a traveller so circumstanced would remain in this labyrinth for life than find his way out of it.

In what he calls Distributio Operis, or *the Distribution of his Work*, he rejects demonstration through syllogism, because it acts more confusedly, and suffers nature to escape from our hands. " For, says he, though there can be no doubt but that things which agree in the middle term, agree also with each other, which indeed possesses a mathematical certainty, yet it is attended with this fraud, that syllogism consists of propositions, propositions consist of words, and words are the signs of notions. If, therefore, the notions of the mind, which are as it were the soul of words, and the basis of the whole of a structure and fabric of this kind, are badly and rashly abstracted from things, and are not sufficiently definite and circumscribed, and lastly, if they are in many respects faulty; the whole structure will fall to the ground." "At nos demonstrationem per syllogismum rejicimus, quod confusius agat, et Naturam emittat è manibus. Tametsi enim nemini dubium esse possit quin, quæ in medio termino conveniunt, ea et inter se conveniant; (quod est mathematicæ cujusdam certitudinis:) nihilominus hoc subest fraudis, quod syllogismus ex propositionibus constet, propositiones ex verbis, verba autem notionum tesseræ et signa sint. Itaque si notiones ipsæ mentis (quæ verborum quasi anima sunt, et totius hujusmodi structuræ ac fabricæ basis) male ac temere à rebus abstractæ, et vagæ, nec satis definitæ et circumscriptæ, denique multis modis vitiosæ fuerint, omnia ruunt." In the preceding chapter, in the animadversions on Locke, I remarked that it is obviously absurd to suppose there can be demonstration without syllogism, since all demonstrative reasoning involves in itself a syllogistic process either latently or apparently. Besides, to reject syllogism because it consists of propositions, propositions consist of words, words are the signs of notions, and notions may happen to be vague and indefinite, is evidently to reject all knowledge, since all knowledge consists of notions, and notions of words. Bacon, therefore, forgot that if what he here asserts were admitted, it would be impossible to judge whether his Novum Organum is a good or a bad performance: for there can be no judgment without notions, and notions are not to be depended on. So that by his own confession, the whole structure of his Organum falls to the ground; since for the very same reason that syllogism is to be rejected, according to him all judgment of the merit or demerit of this, or any other work he has written, is to be rejected. Into such gross absurdities does the lawless spirit of innovation precipitate its votaries.

Again, in another part of his Distributio Operis, he says that the first notions of intellect, [i. e. axioms,] are to be suspected by us, and not to be allowed, unless they are established by a new criterion. That the senses deceive, but indicate their errors. Hence he does not attribute much to the immediate and proper perception of sense, but permits sense to judge only of experiment, and experiment to judge of the thing. He further observes, that how much soever men may admire and nearly adore the human mind, it is certain, that as a mirror whose surface is uneven, changes from its proper figure and section the rays of things, thus also intellect when it is passive to things through sense in framing its notions, inserts and mingles its own nature with the nature of things. Hence, he adds, the purification of intellect in order that it may be adapted to truth, is accomplished by three confutations; by the confutation of philosophies, by the confutation of demonstrations, and by the confutation of native human reason. "Quod vero attinet, ad notiones primas intellectus; nihil est eorum, quæ intellectus sibi permissus congessit, quin nobis pro suspecto sit, nec ullo modo ratum, nisi novo indicio se stiterit, et secundum illud pronuntiatum fuerit. Quinetiam sensus ipsius informationes multis modis excutimus. Sensus enim fallunt utique; sed et errores suas indicant.—Itaque perceptioni sensus immediatæ & propriæ non multum tribuimus: sed eo rem deducimus, ut sensus tantum de experimento, experimentum de re judicet.—Utcunque enim homines sibi placeant, et in admirationem mentis humanæ ac fere adorationem ruant; illud certissimum est, sicut speculum inæquale rerum radios ex figurâ et sectione propriâ immutat; ita et mentem, cum a rebus per sensum patitur, in notionibus suis expediendis et comminiscendis, haud optimâ fide rerum naturæ suam naturam inserere et immiscere.—Itaque doctrina ista de expurgatione intellectus, ut ipse ad veritatem habilis sit tribus redargutionibus absolvitur; redargutione philosophiarum, redargutione demonstrationum, et redargutione rationis humanæ nativæ." According to the *sagacious* Lord Bacon, therefore, as the first conceptions of the mind are to be suspected, this must be the case with the axioms, that of every thing which exists, either affirmation or negation, is true; that the whole is greater than a part; that all beings desire good; and that it is impossible for the same thing to be and not to be at the same time; and a great number of others; though these have been admitted by men in all ages to be self-evidently true, and all science properly so called is built upon them as on a firm and everlasting basis. Sense also according to him is erroneous, and is only to be permitted to judge of experiment, and experiment of the thing which is the subject of it. The first part of this assertion is indeed most true; for, as the Greek poet Epicharmus well observes,

> We nothing accurate, or see, or hear.

But, how is sense to judge of experiment? for judgment I should conceive belongs to intellect and not to sense, since, as the above-mentioned poet beautifully adds,

> "Tis mind alone that sees and hears,
> And all besides is deaf and blind."

The last part of this assertion, that experiment is to judge of the thing, I confess I do not understand. For I can conceive that the person who makes an experiment may form a judgment of it, but I have no notion whatever how the experiment itself is to do this.

In this extract likewise he compares the human intellect to a mirror whose surface is uneven, and says it is as certain that intellect when it is passive to sense, mingles its own nature with the nature of things, as it is that a mirror with an uneven surface changes the rays of things. It is a thing certain, therefore, according to Bacon, and not to be doubted, that intellect distorts things in its perceptions, and is analogous to a mirror with an uneven surface. Hence, as this assertion is called by him *most certain*, and he does not even attempt to prove it, he doubtless considered it as self-evident; and yet the same Bacon thinks fit to consider axioms, or such assertions as that the whole is greater than a part, and that it is impossible for the same thing to be and not to be at the same time, as things which are to be suspected? He also adds, that the purification of intellect in order to its perception of truth, is effected by the confutation of philosophies, *of demonstrations, and of native human reason.*

reason. I can easily conceive that Bacon, in order to establish his own philosophy, would be anxious to expel other philosophies from the mind of his reader; but when he says that the purification of intellect also consists in the confutation of *demonstrations* and *of native human reason*, I freely confess he appears to me to rave. For demonstration is that alone which produces science, and native human reason is that which characterizes man. So that if Lord Bacon was really sane when he wrote this, his intention must have been to brutalize man as much as possible, by persuading him to abandon all that is truly honourable in his nature.

Let us in the next place proceed to consider some of the Aphorisms of his Novum Organum. In the 39th Aphorism, therefore, he says, that there are four kinds of idols which besiege the human mind. These he denominates *the idols of the tribe; the idols of the den; the idols of the forum; and the idols of the theatre.* In the 41st Aphorism he says, that *the idols of the tribe* are founded in human nature itself, and in the tribe of men. For it is falsely asserted that human sense is the measure of things; since on the contrary, all the perceptions as well of sense as of intellect, are from the analogy of man, and not from the analogy o the universe. And that human intellect with respect to the rays of things is like a mirror with an uneven surface, which mingles its own nature with the nature of things, and distorts and infects it. In the 42nd Aphorism, he says, that the *idols of the den* are the idols of an individual man. For every one besides the generic aberrations of human nature, has a certain individual cavern which breaks and corrupts the light of nature; either on account of the proper and peculiar nature of every one; or on account of his conversation and education with others; or on account of the reading of books, and the authorities of those which each individual cultivates and admires; or on account of the differences of impressions, as they occur in a mind pre-occupied, and pre-disposed, or in a mind equable and sedate, or in a mind of this kind. In the 43rd Aphorism, he defines *the idols of the forum*, to be those which arise from the commerce and intercourse of men with each other. For men are associated through conversation; but words are imposed from the apprehension of the vulgar. And, therefore, a bad and unapt imposition of words besieges the intellect in wonderful modes. And in the 44th Aphorism, he defines *the idols of the theatre* to be those which migrate into the minds of men from the different dogmas of philosophies, and also from the perverse laws of demonstrations.

Such are the four idols which Lord Bacon has fabricated in his philosophy, and for the introduction of which he makes no apology, though, as we have before shown, he blames Aristotle for introducing new terms of art; and thus, dictator like, does that himself which he reprobates in another. I appeal, however, to every intelligent reader, whether any thing can be less solid than these idols; and what we are to think of the wisdom and modesty of the man, who expects an immediate assent to the doctrine of them, at the same time that he thinks axioms should be considered as things of a dubious nature?

In the 51st Aphorism he says, " that the human intellect tends to abstract things, on account of its proper nature." Intellectus humanus fertur ad abstracta propter naturam propriam." And yet though he acknowledges that this tendency is natural to intellect, he says in the 104th Aphorism, " That lead and weights are rather to be added to the human intellect, in order that all its leaps and flights may be restrained. That this has not yet been done, but that when it is, we may entertain better hopes of the sciences." Itaque hominum intellectui non plumæ addendæ, sed plumbum potius, et pondera; ut cohibeant omnem saltum et volatum. Atque hoc adhuc factum non est; quum vero factum fuerit, melius de scientiis sperare licebit." He, therefore, who wishes to make a proficiency in the philosophy of Bacon, must do violence to his intellect, and endeavour as much as possible to alter its nature, though this its nature is the gift of divinity, to whom by this tendency to universals it at the same time aspires. By heavy weights also he must confine it to sensible objects, lest its natural impulse to ascend, should at length cause it to fly away. Certainly, as I have elsewhere observed, a considerable portion of lead was added to the intellect of Bacon when he wrote this Aphorism; and indeed, the whole of the Novum Organum

may

may be truly said to be the work of a man of a *depressed intellect.* I had almost forgot however one exception to this observation, and that is the following passage in the 66th Aphorism, which is perfectly conformable to the doctrine of Plato and Aristotle. "Si quis observaverit, inesse corporibus appetitum contactus ad invicem, ut non patiantur unitatem naturæ prorsus dirimi, aut abscindi, ut vacuum detur:—aut si quis dicat, inesse corporibus appetitum congregationis ad massas connaturalium suorum, densorum videlicit versus orbem terræ, tenuiorum et rariorum versus ambitum cœli; hæc et ejusmodi vere physica sunt genera motuum."—i. e. "If any one shall have observed that there is in bodies an appetite of contact towards each other, so that they do not suffer the unity of nature to be entirely broken or cut off that a vacuum may be introduced;—or if any one should say that there is in bodies an appetite of congregation to the masses of their own connatural substances, viz. of dense bodies towards the orb of the earth, and of thin and rare bodies towards the ambit of the heavens; these, and others of the like sort, are truly physical kinds of motions."

With the exception therefore of this passage, I perfectly accord with the following censure on this work of Bacon, extracted from the Biographia Brittanica. Mr. Chamberlain, in a letter to Sir Dudley Carleton, dated at London, Oct. 28, 1620, mentions that Mr. Cuffe, the Earl of Essex's Secretary, having *long since perused the Novum Organum, gave this censure, that a fool could not have written such a work, and that a wise man would not.* And in another letter written in the February following, Mr. Chamberlain takes notice, that the king [viz. James] could not forbear sometimes in reading that book to say, *that it was like the peace of God, that surpasseth all understanding.*" And thus much for Lord Bacon, respecting whom Pope was certainly egregiously mistaken when he calls him the *wisest and brightest* of mankind, though perhaps he was right in denominating him the *meanest* [7].

CHAP.

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[7] The following prayer of Lord Bacon, in the Preface to his Novum Organum, appears to me to be written in the true spirit of Methodistical cant, and to be no less remarkable for affected humility than consummate arrogance.

"Quamobrem, in principio operis, ad Deum Patrem, Deum Verbum, Deum Spiritum, preces fundimus

CHAPTER III.

HAVING discussed the Novum Organum, let us in the next place show the absurdity of making experiment to be the criterion of truth, which Lord Bacon does, and for which he is so much applauded by modern philosophers.

First, then, the patrons of this hypothesis appear to be ignorant of the invariable laws of demonstration properly so called, and that the necessary requisites of all demonstrative propositions are as we have before observed these; that they exist as causes, are primary, more excellent, true,

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dimus humillimas, et ardentissimas, ut humani generis ærumnarum memor, et peregrinationis istius vitæ, in qua dies paucos et malos terimus, novis suis eleemosynis, per manus nostras, familiam humanam dotare dignetur. Atque illud insuper supplices rogamus, ne humana divinis officiant; neve ex reseratione viarum sensus, et accensione majore luminis naturalis, aliquid incredulitatis et noctis animis nostris erga divina mysteria oboriatur: sed potius ut ab intellectu puro, à phantasiis et vanitate repurgato, et divinis oraculis nihilominus subdito et prorsus dedititio, fidei dentur, quæ fidei sunt. Postremo, ut scientiæ veneno à serpente infuso, quo animus humanus tumet & inflatur, deposito, nec altum sapiamus, nec ultra sobrium, sed veritatem in charitate colamus." i. e —

"In the beginning of the work, therefore, we pour forth most humble and ardent prayers to God the Father, God the Word, and God the Spirit, that being mindful of the miseries of the human race, and of the peregrination of that life in which we pass a few and evil days, *they will deign in their new pity, to benefit the human race through our hands*. And besides this we suppliantly beg that human may not injure divine concerns; and that from the disclosing the passages of sense, and a greater enkindling of natural light, nothing of incredulity and night may arise in our minds towards divine mysteries; but rather that from a pure intellect, purged from phantasies and vanity, and nevertheless subjected and entirely submitted to the divine oracles, those things may be given to the faith which are of the faith. And in the last place, we suppliantly entreat them, that having put away the *poison of science infused by the serpent*, with which the human mind swells and is inflated, we may neither be loftily wise, nor sober beyond measure, but that we may cultivate truth in the love of it."

If by *the poison of science infused by the serpent*, Bacon means *the knowledge of good and evil*, which Adam obtained through the serpent, there was no occasion to pray to the Trinity, that "having put this away he might not be loftily wise," for without this knowledge he must inevitably be a fool.

true, and known, than the conclusions. For every demonstration not only consists of principles prior to others, but of such as are eminently first; since if the assumed propositions may be demonstrated by other assumptions, such propositions may indeed appear prior to the conclusions, but are by no means entitled to the appellation of first. Others, on the contrary, which require no demonstration, but are of themselves manifest, are deservedly esteemed the first, the truest, and the best. Such indemonstrable truths were called by the antients, axioms, from their majesty and authority, as the assumptions which constitute demonstrative syllogisms derive all their force and efficacy from these.

In the next place, they seem not to be sufficiently aware, that universal is better than partial demonstration. For *that* demonstration is the more excellent which is derived from the better cause; but a universal is more extended and excellent than a partial cause. Since the arduous investigation of *the why* in any subject is only stopped by the arrival at universals. Thus, if we desire to know why the outward angles of a triangle are equal to four right angles, and it is answered, because the triangle is isosceles; we again ask, But why because isosceles? And if it be replied, because it is a triangle, we may again enquire, But why, because a triangle? To which we finally answer, because a triangle is a right-lined figure. And here our enquiry rests at that universal idea, which embraces every preceding particular one, and is contained in no other more general and comprehensive than itself. Add, too, that the demonstration of particulars is almost the demonstration of infinites; of universals the demonstration of finites; and of infinites there can be no science. *That* demonstration likewise is the best which furnishes the mind with the most ample knowledge; and this is alone the province of universals. We may also add, that he who knows universals knows particulars likewise in capacity; but we cannot infer that he who has the best knowledge of particulars knows any thing of universals. And lastly that which is universal is the object of intellect and reason; but particulars are co-ordinated to the perceptions of sense.

But here perhaps the experimentalist will say, admitting all this to be true, yet we no otherwise obtain a perception of these universals than by an induction of particulars, and abstraction from sensibles. To this I answer, that the universal which is the proper object of science, is not by any means the offspring of abstraction; and induction is no otherwise subservient to its existence than as an exciting cause. For if scientific conclusions are indubitable, if the truth of demonstration is necessary and eternal, this universal is *truly all*, and not like that gained by abstraction, limited to a certain number of particulars. Thus the proposition that the angles of *every* triangle are equal to two right, if it is indubitably true, that is, if the term *every* in it *really* includes *all* triangles, cannot be the result of any abstraction; for this, however extended it may be, is limited, and falls far short of *universal* comprehension. Whence is it then that the reasoning power concludes thus confidently that the proposition is true of *all* triangles? For if it be said that the mind, after having abstracted triangle from a certain number of particulars, adds from itself what is wanting to complete the *all*; in the first place, no man I believe, will say that any such operation as this took place in his mind when he first learnt this proposition; and in the next place, if this should be granted, it would follow that such proposition is a mere fiction, since it is uncertain whether that which is added to complete the *all* is *truly* added; and thus the conclusion will no longer be *indubitably necessary*.

In short, if the words *all* and *every* with which every page of theoretic mathematics is full, mean what they are conceived by all men to mean, and if the universals which they signify are the proper objects of science, such universals must subsist in the soul prior to the energies of sense. Hence it will follow that induction is no otherwise subservient to science, than as it produces credibility in axioms and petitions; and this by exciting the universal conception of these latent in the soul. The particulars therefore, of which an induction is made in order to produce science, must be so simple, that they may be immediately apprehended, and that the universal may be predicated of them without hesitation. The particulars of the experimentalists are not of this kind, and therefore never can be the sources of science truly so called.

Of this however, the man of experiment appears to be totally ignorant, and in consequence of this, he is likewise ignorant that parts can only be truly known through wholes, and that this is particularly the case with parts when they belong to a whole, which, as we have already observed from comprehending in itself the parts which it produces, is called a whole prior to parts. As he, therefore, would by no means merit the appellation of a physician who should attempt to cure any part of the human body without a previous knowledge of the whole; so neither can he know any thing truly of the vegetable life of plants, who has not a previous knowledge of that vegetable life which subsists in the earth as a whole prior to, because the cause of, all partial vegetable life, and who still prior to this has not a knowledge of that greater whole of this kind which subsists in nature herself; nor, as Hippocrates justly observes, can he know any thing truly of the nature of the human body, who is ignorant what nature is considered as a great comprehending whole. And if this be true, and it is so most indubitably with all physiological enquiries, how much more must it be the case with respect to a knowledge of those incorporeal forms which, in consequence of proceeding from wholes entirely exempt from body, are participated by it, with much greater obscurity and imperfection? Here then is the great difference, and a mighty one it is, between the knowledge gained by the most elaborate experiments, and that acquired by scientific reasoning, founded on the spontaneous, unperverted, and self-luminous conceptions of the soul. The former does not even lead its votary up to that one nature of the earth from which the natures of all the animals and plants on its surface, and of all the minerals and metals in its interior parts, blossom as from a perennial root. The latter conducts its votary, through all the several mundane wholes, up to that great whole the world itself, and thence leads him through the luminous order of incorporeal wholes, to that vast whole of wholes, in which all other wholes are centered and rooted, and which is no other than the principle of all principles, and the fountain of deity itself. No less remarkable likewise is the difference between the tendencies of the two pursuits: for the one elevates the soul to the most luminous heights, and to that great ineffable which is beyond all altitude; but the other is the cause of a mighty calamity to the soul, since according to the elegant expression of Plutarch, it extinguishes her principal and brightest eye, the knowledge of divinity. In short, the one leads to all that is grand, sublime and splendid in the universe, the other to all that is little, grovelling and dark. The one is the parent of the most pure and ardent piety; the genuine progeny of the other are impiety and atheism. And the one confers on its votary the most sincere permanent and exalted delight; the other continual disappointment, and unceasing molestation.

But the following testimonies of some of the most illustrious of the moderns, very satisfactorily prove the insufficiency of experiment to the attainment of truth. And in the first place this is evident from the testimony of Boerhaave, a man whose character I greatly esteem for the probity of his manners and the piety of his disposition. In his Elements of Chemistry, therefore, p. 290, he observes as follows: "The air is of a quite different nature in particular places; first, on account of the land or soil, or the part of the earth which the air under consideration hangs over. For according to the various bodies with which the earth abounds in any particular part, the exhalations and vapours that arise from it will possess as various qualities, and for this reason the air in that part will be full of corpuscles, that are not to be met with any where else. The truth of this has always been confirmed by numberless examples. *And hence it will come to pass, that in such particular parts of the air, certain experiments may be made, that will never succeed in any other.* In the second place, a very great diversity is here observed likewise, in respect to the soil, in different places, according as men inhabit it, and keep animals there, and according as they dung and turn up the ground, and exercise various occupations there, and by this means raise up almost all kinds of bodies into the air: on which account again, an infinite number of changes are observed to happen, which are not to be effected elsewhere. A certain chemist, for instance, in his laboratory, where he was daily employed in the distillation of large quantities of vinegar, exposed to the air some pure, dry, alcaline salt of tartar in a glass plate: the air of consequence, being full of acid vapours, dissolved the salt into an oil of tartar *per deliquium*, and at the same time so closely united the acid parts of the volatile vinegar with the alcali of the tartar, as at length to convert the saturated mass into a *tartarum regeneratum*, or regenerated tartar, which melted in the fire like wax, and yielded a very noble remedy for the resolving of viscid tenacious humours in almost all diseases. He was mightily pleased therefore with this production, for he reckoned he had now discovered the great secret of the Alchemists, for incerating, according to the language of those gentlemen, a fixed alcaline salt. But when afterwards he attempted to repeat the experiment in another place, where there was not so great and constant a quantity of vinegar in the air, he met with nothing like the former success. *The same thing might be farther made appear by a vast number of instances*, but you yourselves are sufficiently apprised of it.

" Consider then a little how prodigiously the air may be changed in any particular place, when a great earthquake has occasioned exhalations to arise there very different from what there did before. And this is again confirmed by history, which informs us that certain parts of the earth have become uninhabitable, by reason of the abominable fetid vapours with which they have been infested after earthquakes. But again, inundations by rain, overflowings of rivers, and the breaking in of the sea, make such alterations in the atmosphere, by means of the humid vapours, and exhalations from putrified bodies hence occasioned, that the whole nature of the air in those places is entirely changed. The very winds likewise, as they carry the air with all its contents from one place to another, must always bear along with them something from the places from whence they began to blow, and consequently are thus always varying the contents of the air, continually carrying off from particular places the matter peculiar to them, and supplying them again with what they just brought from some others. From which cause likewise, there must needs happen in chemical operations, a remarkable diversity. And as for the influences of the heavens, particularly in respect of the various aspects of the sun and moon, their accessions, recessions, perpendicular or oblique irradiations, conjunctions, and oppositions, what changes must these produce in the air, by their attraction, repulsion, and the heat and cold that depend upon them? What variation must they cause in the vapours and exhalations that are carried up from the earth into the air?

" But there is one thing farther on this head, which as chemists we ought to take particular notice of, and that is, the vicissitude of the seasons of the year, which is here of such efficacy, as is wholly incredible; even setting aside that which arises from the various actions of the sun in his stated annual course. You will understand what I mean in the following manner. If the sun on the 10th of March, in a certain altitude, and with a certain degree of heat exerts its power on the earth, it then acts on a body, which in the preceding winter, being locked up by the cold, has kept in and accumulated, under an icy or cold crust, its own proper exhalations, and at the same time has received and retained whatever came down upon it out of the air. Hence, as soon as it begins to thaw, and the earth resolves itself into a loose mould, the first succeeding heat of the sun acts upon this fertile pregnant body, and immediately fills the whole air with vapours. On which account, a vernal heat hardly ever succeeds a frost of long continuance, but there presently follow showers, thunders and lightnings, and an igneous vigour appears in all animals and vegetables. But now, when on the 10th of September, the sun at the same altitude, and with the same degree of heat acts upon the earth, it then finds it parched up and exhausted by the heat of the preceding summer, and not yet moistened with autumnal showers; for which reason, neither the same heat in the earth, or air, will produce the same effect, nor will excite this vigour in animals and vegetables, as it does in the spring. These few things then will be sufficient to let us easily see the variety there is in the atmosphere, according to the diversity of the season of the year, as far as it arises principally from this cause; a speculation very useful both in chemistry and natural philosophy. And indeed it is plain the chemists had some insight into this matter long ago, when they attributed to the vernal rain, a virtue so much superior to that of the autumnal, produced in the very same degree of heat. For they found that this lixivium of the air brought along with it out of the air very different vapours and exhalations, according to the diversity of the season now explained."

Nor is experiment attended with less uncertainty in the other subjects of it; since these subjects are liable to great alterations from the commixture of one thing with another, from the influence of the seasons and the heavenly bodies, from the diversity of the places in which the subjects are found, from the instruments employed in making experiments on them, and, in short, from ten thousand accidental causes. Greatly, therefore, as experiment may contribute to the arts, and to the refinements and luxuries of life, it is impossible while it is attended with this uncertainty that it can become the basis of science properly so called. For nothing is capable of producing science that is not invariably the same; and this is the prerogative only of that which is axiomatical or self-evident, as we have before observed. Indeed, in consequence of the variable nature of the materials which are the subjects of experiment, and the other causes just assigned, he who deduces any consequences from an experiment, or admits them when deduced by another person, can have no certainty that the consequences are true, unless he makes the experiment himself, and after all, both he and a thousand others that have made it may happen to be mistaken; and this being the case, as it most evidently is, the knowlege thus obtained has nothing of that accuracy and stability which are the characteristics of genuine science.

CHAPTER IV.

In the next place, I shall adduce as a proof of the uncertainty of the knowledge founded on experiment, the following extracts from the Lectures of the celebrated Professor of Chemistry, Dr. Davy.

In his Bakerian Lecture, therefore, published in the Philosophical Transactions for 1808, he observes, "That the more caution is necessary in avoiding any theoretical expression in terms, because the new electro-chemical phenomena that are daily becoming disclosed, seem distinctly to show that the mature time for a complete generalization of chemical facts is yet *far distant*; and though in the explanations of the various results of experiments that have been detailed, the antiphlogistic solution of the phenomena has been uniformly adopted, yet *the motive for employing it has been rather a sense of its beauty and precision, than a conviction of its permanency and truth.* The discovery of the agency of the gasses destroyed the hypothesis of Stahl. *The knowledge of the powers and effects of the etherial substances may at a future time possibly act a similar part with regard to the more refined and ingenious hypothesis of Lavoisier*; but in the present state of our knowledge, it appears the best approximation that has been made to a perfect logic of chemistry."

Here Dr. Davy acknowledges, *that the time for a complete generalization of chemical facts is yet far distant; and that as the hypothesis of Stahl has been destroyed by one discovery, that of Lavoisier may also by another.* By which confession it is evident that there is not as yet any thing like science in chemistry.

Again, in the 2nd part of the Philosophical Transactions of the same year, Dr. Davy observes, "That certain electrical states always coincide with certain chemical states of bodies. Thus, acids are uniformly negative, alkalies positive, and inflammable substances highly positive; and, as I have found, acid matters when positively electrified, and alkaline matters when negatively electrified, seem to lose all their peculiar properties and powers of combination. In these instances, the chemical qualities are shown to depend upon the electrical powers ; and *it is not impossible* that matter of the same kind, possessed of different electrical powers, may exhibit different chemical forms. *I venture to hint at these notions; but I do not attach much importance to them. The age of chemistry is not yet sufficiently mature for such discussions. The more subtile powers of matter are but just beginning to be considered; and all general views concerning them, must as yet rest upon feeble and imperfect foundations.*"

In the 1st part also of the Philosophical Transactions for 1809, Dr. Davy observes, "*That the more approaches are made in chemical enquiries towards the refined analysis of bodies, the greater are the obstacles which present themselves, and the less perfect the results.*" And again, "*The first methods of experimenting on new objects, likewise are necessarily imperfect; novel instruments are demanded, the use of which is only gradually acquired, and a number of experiments of the same kind must be made, before one is obtained from which correct data for conclusions can be drawn.*" And in the same part, he also adds, "That as our inquiries at present stand, the great general division of natural bodies is into matter which is, or may be supposed to be metallic, and oxygene; but till the problem concerning the nature of nitrogene is fully solved, all systematic arrangements made upon this idea must be regarded as premature."

Dr. Davy also in his 7th Lecture, at the Royal Institution in 1811, observed, "*That the present state of knowledge may be considered as an approximation to truth, rather than the discovery of truth itself.* He likewise stated at some length the leading parts of the phlogistic and antiphlogistic theories, and admitted that the latter when it was formed, agreed better with phenomena; but *farther discoveries he said would make a material alteration in the new nomenclature necessary, and produce a change in the whole theory of chemical science.*" And he concluded his Lecture with observing, that the science of chemistry was rapidly advancing to a state of simplicity, in which the number of its elements would be reduced to a very few, and in which it was *probable*, we should be able to anticipate its results in all cases with certainty and precision[1]."

I appeal to every unprejudiced reader, whether it does not most plainly appear from all this, that the knowledge that has been obtained by such a prodigious accumulation of chemical experiments as have been made since the time of Bacon, is merely conjectural, according to Dr. Davy, that it possesses no certainty whatever, and *at best produces in its votaries nothing more than a hope that it may lead to certainty hereafter.*

I shall present the reader with one extract more from another lecture of Dr. Davy, and then dismiss him: "He observed, that it was now eleven years since he had delivered annually a course of Lectures on Chemistry at the Royal Institution. *Were the principles, he said, of this science fully established, great would be his difficulty in making the subject again interesting.*—In the Lecture, he admitted that chemical combinations were now reduced to calculation, and *the operations of chemistry determined by certain definite laws*[2]."

I scarcely think the above extract can be paralleled for absurdity. For, in the first place, can any thing be more ridiculous than to call chemistry a science, and yet acknowledge that its principles are not fully established? And, in the next place, is it not monstrous to assert, that if the principles of it were fully established, there would be great difficulty in making it interesting? To which we may add, that this is obviously confessing that chemistry is interesting only, because its principles are fluctuating. Afterwards, however, he says, "That the operations of chemistry are now determined by certain definite laws." These *definite laws* then are *firm principles*, so that here is a plain contradiction of the former assertion[3]. Such are the incongruities, such the glaring absurdities, such the direct contradictions, which accompany the tenets of modern philosophy. Compare this with the consummately accurate and scientific writings of Plato and Aristotle, and then you will wonder at and lament the fallacy and nothingness of what is now called philosophy.

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[1] The extracts from this Lecture are copied from the Observer, March 3, 1811.

[2] From the Observer of January 26, 1812.

[3] At one of Dr. Busby's recitations from his new translation of Lucretius, a gentleman observed that he had used in his translation the term *caloric*, but that Dr. Davy was now returning to *heat*. It

The last testimony I shall adduce on this subject, is that of Dr. George Pearson, in No. 142, of Nicholson's Journal. "I am of opinion, says he, that the best founded chemical conclusions are butprovisional; and of course that chemistry has not yet attained the rank of a science, or at least of a demonstrative science. This opinion seems just from a retrospective view of the varying states of chemistry for the last hundred years. Many of the theories of the illustrious Stahl were, for half a century, admitted as demonstrations of the agency of phlogiston. That these doctrines were erroneous, was evinced by the succeeding discovery of the agency of oxygen, especially manifested by the ever-to-be-lamented Lavoisier; and the pneumatic doctrine, in some parts, has lately been rendered doubtful, if not exploded, by *the wondrous achievments* of Professor Davy."

Nothing can more clearly prove the insufficiency of experiment to the acquisition of science properly so called, than the above testimonies[4]. For chemistry, from its extensive nature, affords beyond all other

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It occurred to me on hearing this, that a humorous poem might be made from this circumstance, in which the different modern chemical theories should be personified as so many alluring damsels, and that the terms *phlogiston*, *hydrogen*, *oxygen*, *caloric*, *gas*, and, in short, the whole of the new chemical nomenclature, should also be personified as automata, which served as playthings to the Theories. In the course of the poem, Dr. Davy might be represented as having been once attached to the Theory that was fond of the plaything *heat*, but that he had abandoned her for the Theory that was partial to *caloric*. On unexpectedly, however, seeing his former mistress, and finding his love for her revive, he says to his disciples, who were amusing themselves with the plaything caloric,

From caloric now retreat,
For I am coming back to heat.

[4] As the reasoning from experiment must necessarily be always accompanied with uncertainty, the ancients from its dubious nature, appear very properly to have classed it among things of a problematical kind. And hence, Aristotle in his Problems decides nothing, but perpetually interrogates.

subjects most ample materials for the operations of experiment; and yet though more than a century and a half has elapsed since the Novum Organum of Bacon was written, that Bible of the experimentalists, conjecture only has been the result of laborious research, and a hopeless adoption of one theory instead of another. Nor is it possible it can ever be otherwise. For the only sure guides to science are the self-luminous truths of axioms, and indubitable facts acquired by simple observation, and not the ignis fatuus of experiment; and he who abandons the former for the latter, will quit certainty for hypothesis, and by descending deeper and deeper into the darkness of matter, at length lose himself in her inextricable labyrinths.

CHAPTER V.

LET us in the next place examine the philosophy, or physical astronomy, as it is called, of Newton, and we shall find that it is founded on erroneous principles, and is a remarkable instance of the possibility of deducing, in many cases true conclusions from premises thatare false.

One of the definitions, therefore, which form the basis of his philosophy, is the following: "The *vis insita*, or *innate force of matter*, is a power of resisting, by which every body, as much as in it lies, endeavours to perserve in its present state, whether it be of rest, or moving uniformly forward in a right line."

In this definition an innate force is ascribed to matter, which completely subverts the natural tendencies of bodies that rank as parts to their wholes. The reality of this tendency is demonstrated from Aristotle in the 2d book of this work, in which it is observed, that what is naturally moved, upward or downward, is moved from its own form in capacity to its own form in energy. Thus in heat, if that which is productive of heat moves, but that which is in capacity hot is moved to the being hot in energy, it is evident that for a thing to be moved to that to which it is naturally adapted, is nothing else than for it to be moved to its own form, and to become hot in energy. And as long as it is moved upward or downward, it has not yet perfectly received its own form, since it is yet in *generation*, or in a tendency to the actual possession of form. When therefore it arrives at its proper place, then it acquires its proper form; for it then acquires that in energy, which it was in capacity. Hence bodies are naturally moved downward, because the very essence of that which is heavy is to be naturally downward. Those things, therefore, which are yet in capacity heavy, are changed to their own form, by that which is naturally adapted to move according to gravity, viz. by that which causes earth or water to be heavy in energy. For the parts of wholes, though they are not in any detaining place when they are in continuity with their wholes, yet together with the wholes they are in that place in which, having a subsistence in energy, they also acquire the perfection of themselves according to form. Hence, if this is true, and, as Aristotle says, for any body to tend to its own place, is to tend to its own form, that which acquires the form of the heavy or the light, is no longer moved.

In consequence, therefore, of the wholes in the universe being prior to, as the causes of, the parts they contain, as we have shown in chap. 1. of this book, these parts have a natural tendency to them, as to the sources of their perfection. Of this great truth, however, Newton was ignorant, and therefore supposes that a body once in motion, whatever its direction may be, as for instance, a stone when moving upward, endeavours to persevere in this motion; and thus entirely subverts the natural desire which parts have to be united with their wholes. In thus speaking also, he abandons the doctrine of his master Bacon, who, as we have before observed says, in the 66th Aphorism of his Novum Organum, "*that there is in bodies an appetite of congregation to the masses of their own connatural substances, viz. of dense bodies towards the orb of the earth, and of thin and rare bodies towards the ambit of the heavens.*" This doctrine likewise of Aristotle, that bodies never possess their full perfection till they are united to their wholes, is in consequence of that most sublime dogma of the Platonic philosophy, that all things not only abide in, and proceed from, but also return to the principles of their existence. In short, *this appetite of parts to be congregated to their wholes, is properly the gravity of bodies.* Hence, as Simplicius observes, Plato says that all the elements have gravity, not however in such a manner as if all of them were moved to the centre, those that are more heavy subsiding, and those that are less heavy being expelled and emerging above them, and on this account denominated light; but he says that all of them have gravity, because all of them on account of gravity, have a tendency to their proper place. For orexis, or appetite, leads each of them to its kindred nature. But the leading is through gravity, and the permanency of each in its proper place is derived from this power. Hence Plato calls fire heavy as well as earth, and says that each of the elements abides in its proper place, through its own gravity, but is divulsed from its proper place so far as it is light. Hence too, gravity alone without levity is present with the wholes of the elements; for they do not depart, nor are divulsed from their proper places. But levity is present with the parts of these wholes, according to which they are adapted to pass into places contrary to their nature. Plato therefore in the Timæus, concluding what he had said on the subject, adds: "*One thing however is to be understood concerning all these, that the progression of each, tending to its kindred nature, renders the proceeding body heavy,* and the place to which it tends, downward." THE NATURAL TENDENCY THEREFORE OF THE PARTS OF BODIES TO THEIR KINDRED WHOLES IS GRAVITY, of which tendency Newton being ignorant, supposed that there was an innate force in bodies of persevering in their present state, whether it be of rest, or moving uniformly forward in a right line.

His first axiom, therefore, or law of motion, is false; viz. "That every body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed upon it." For, on the contrary, if a body is moved in a direction contrary to its natural tendency, it endeavours as much as possible to move in a direction conformable to that tendency, or, in the language of Lord Bacon, conformable to its appetite of being congregated to its own connatural mass.

His third axiom likewise is not accurate, viz. "That to every action there is *always* opposed an equal re-action : or that the mutual action of two bodies upon each other is *always* equal, and directed to contrary parts." For action and re-action are not *always* equal, as Aristotle has shown in the 4th book of his treatise On the Generation of Animals. "For, says he, the cause that motions are dissolved is this, that the agent also suffers from the patient. Thus that which cuts is blunted by that which is cut, and that which heats is refrigerated by that which is heated. And, in short, that which moves, except the first mover, is reciprocally moved with a certain motion. Thus for instance, that which impels is after a certain manner impelled, and that which presses is reciprocally pressed. And, in short, that which acts sometimes reciprocally suffers more than it acts[1], and that which heats indeed is refrigerated, and that which refrigerates is heated, at one time not at all acting itself, and at another time acting less than it suffers[2]." Neither Newton, however, nor any of his disciples, appear to have known that action and re-action are not *always* equal, or that Aristotle had asserted that they are not. But in the Encyclopedia Britannica, I find that both Mr. Young and the authors of that work object to this axiom or law of motion as it is called. And the objections of Mr. Young are as follows:

"When an action generates no motion, it is certain that its effects have been destroyed by a contrary and equal action. When an action generates two contrary and equal motions, it is also evident that mutual actions were exerted, equal and contrary to each other. All cases where one of these conditions is not found, are exceptions to the truth of the law. If a finger presses against a stone, the stone if it does not yield to the pressure, presses as much upon the finger; but if the stone yields, it reacts less than the finger acts; and if it should yield with all the momentum that the force of the pressure ought to generate, which it would do if it were not impeded by friction, or a medium, it would not react at all. So if the stone drawn by a horse, follows after the horse, it does not react so much as the velocity of the stone is diminished by friction, and it is the reaction of friction only, not of the stone. The stone does not react because it does not act, it resists, but resistance is not action.

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[1] Thus that which is hot is sometimes refrigerated in a greater degree than it heats. And, indeed, the agent may be so infirm, that it may not only act in a less degree than it suffers, but may likewise be almost wholly prevented from action.

[2] αιτιον δε του μεν λυεσθαι τας κινησεις, οτι το ποιουν και πασχει υπο του πασχοντος· οιον το τεμνον αμβλυνεται υπο του τεμνομενου, και το θερμαινον ψυχεται υπο του θερμαινομενου, και ολως το κινουν εξω του πρωτου, αντικινειται τινα κινησιν· οιον το ωθουν αντωθειται πως, και αντιθλιβεται το θλιβον. ενιοτε και ολως επαθε μαλλον ἢ εποιησε, και εψυχθη μεν το θερμαινον, εθαρμανθη δε το ψυχον· οτε μεν ουθεν ποιησαν, οτε δε ηττον ἢ παθον.

In the loss of motion from a striking body, equal to the gain in the body struck, there is a plain solution without requiring any re-action. The motion *lost* is identically that which is *found* in the other body; this supposition accounts for the whole phenomenon in a most simple manner.

The objections of the authors of the Encyclopedia are as follow:

" If there be a perfect reciprocity betwixt an impinging body and a body at rest sustaining its impulse, may we not, at our pleasure, consider either body as the agent, and the other as the resistant? Let a moving body A pass from north to south, an equal body B at rest, which receives the stroke of A, act upon A from south to north, and A resist in a contrary direction, both inelastic: let the motion reciprocally communicated be called six. Then B at rest communicates to A six degress of motion towards the north, and receives six degrees towards the south B, having no other motion than the six degrees it communicated, will, by its equal and contrary loss and gain, remain in equilibrio. Let the original motion of A have been twelve, then A having received a contrary action equal to six, six degrees of its motion will be destroyed, or in equilibrio; consequently, a motive force as six will remain to A towards the south, and B will be in equilibrio, or at rest. A will then endeavour to move with six degrees, or half its original motion, and B will remain at rest as before. A and B being equal masses, by the laws of communication, three degrees of motion will be communicated to B, or A with its six degrees, will act with three, and B will re-act also with three. B then will act on A from south to north equal to three, while it is acted upon or resisted by A from north to south, equal also to three, and B will remain at rest as before; A will also have its six degrees of motion reduced to one-half by the contrary action of B, and only three degrees of motion will remain to A, with which it will yet endeavour to move; and finding B still at rest, the same process will be repeated till the whole motion of A is reduced to an infinitely small quantity, B all the while remaining at rest, and there will be no communication of motion from A to B, which is contrary to experience.

"Let a body A, whose whole mass is twelve, at rest, be impinged upon first by B, having a mass as twelve, and a velocity as four, making a momentum of forty-eight; and secondly by C, whose mass is six, and velocity eight, making a momentum of forty-eight equal to B, the three bodies being inelastic. In the first case, A will become possessed of a momentum of twenty-four, and twenty-four will remain to B; and in the second case A will become possessed of a momentum of thirty-two, and sixteen will remain to C, both bodies moving with equal velocities after the shock, in both cases by the laws of percussion. It is required to know if, in both cases, A resists equally, and if B and C act equally? If the actions and resistances are equal, how does A, in one case, destroy twenty-four parts of B's motion, and, in the other case, thirty-two parts of C's motion, by an equal resistance? And how does B communicate, in one case, twenty-four degrees of motion, and C thirty-two, by equal actions? If the actions and resistances are unequal, it is asked, how the same mass can resist differently to bodies impinging upon it with equal momenta; and how bodies, possessed of equal momenta, can exert different actions, it being admitted that bodies resist proportional to their masses, and that their power of overcoming resistance is proportional to their momenta?

"It is incumbent on those who maintain the doctrine of universal reaction, to free it from these difficulties and apparent contradictions."

The authors, also, of the above-mentioned Encyclopedia object to another fundamental principle of Newton's philosophy, as follows: "The principal lemma on which the whole of the mathematical part of the Newtonian philosophy depends is this: "That quantities and the ratios of quantities, which in any finite time converge continually to equality, and before that time approach nearer the one to the other than by any given difference, become ultimately equal. If you deny it; suppose them to be unequal, and let D be their ultimate difference. Therefore they cannot approach nearer to equality than by that given difference D, which is against the supposition."

Concerning the meaning of this lemma philosophers are not agreed; and, unhappily, it is the very fundamental position on which the whole of the system rests. Many objections have been raised to it by people who supposed themselves capable of understanding it. They say, that it is impossible we can come to an end of any infinite series, and therefore that the word *ultimate* can, in this case, have no meaning. In some cases the lemma is evidently false. Thus, suppose there are two quantities of matter, A and B, the one containing half a pound, and the other a third part of one. Let both be continually divided by 2; and though this ratio, or the proportion of the one to the other, doth not vary, yet the difference between them perpetually becomes less, as well as the quantities themselves, until both the difference and quantities themselves become less than any assignable quantity; yet the difference will never totally vanish, nor the quantities become equal, as is evident from the two following series.

$$\begin{array}{rcccccl} & \frac{1}{2} & \frac{1}{4} & \frac{1}{8} & \frac{1}{16} & \frac{1}{32}, & \text{\&c.} \\ & \frac{1}{3} & \frac{1}{6} & \frac{1}{12} & \frac{1}{24} & \frac{1}{48}, & \text{\&c.} \\ \hline \text{Diff.} & \frac{1}{6} & \frac{1}{12} & \frac{1}{24} & \frac{1}{48} & \frac{1}{96}, & \text{\&c.} \end{array}$$

Thus we see that though the difference is continually diminishing, and that in a very large proportion, there is no hope of its vanishing, or the quantities becoming equal. In like manner let us take the proportions or ratios of quantities, and we shall be equally unsuccessful. Suppose two quantities of matter, one containing eight, and the other ten, pounds; these quantities already have to each other the ratio of eight to ten or of four to five; but let us add two continually to each of them, and though the ratios continue to come nearer to that of equality, it is in vain to hope for a perfect coincidence.

Thus,

	8	10	12	14	16	18	20,	&c.
	10	12	14	16	18	20	22,	&c.
Ratio	$\frac{4}{5}$	$\frac{5}{6}$	$\frac{6}{7}$	$\frac{7}{8}$	$\frac{8}{9}$	$\frac{9}{10}$	$\frac{10}{11}$,	&c.;

CHAPTER VI.

These, however, are not the only, nor the most important objections that may be made to the philosophy of Newton, as I trust will be evident from the following remarks.

In the first proposition then of the first book of the Principia, it is asserted, that if a body move in any line, and be turned from it by a centripetal force directed to any point, not lying in that line, the body will move in a curve lying in the plane that passes between the point and the line, and the curve will be concave towards the point, and will describe round its areas proportionable to the times. This proposition also forms the eleventh of the first book of Dr. Gregory's Elements of Astronomy. In this proposition it is taken for granted, that the same consequence will ensue when a body thus moving produces a polygon, as when it produces a curve. This, however, is false; for Aristotle has shown, in the second chapter of his Mechanical Problems, that the body which is moved with two such motions as above, so as to move in the diagonal of a parallelogram, will be moved with motions that are in the ratio of the sides of that parallelogram; but that when it is moved with these motions, so as to move in the arch of a circle, [and the same thing is true when it moves in the arch of any other curve returning into itself,] the motions then have no ratio to each other. The words of Aristotle are as follow: "It is evident, therefore, that the thing which is moved according to the diameter with two lations, must necessarily be moved according to the ratio of the sides [of the quadrilateral figure]. For if it is moved in any other ratio, it will not procced according to the diameter. But if it is moved in no ratio with two motions, and in no time, it is impossible that the lation should be in a right line. This, therefore, being made a diameter, and a quadrilateral figure being described about it, that which is moved must necessarily be moved according to the ratio of the sides. For this has been before demonstrated. Hence, that which is moved in no ratio, and in no time, will not produce a right line; for if it should be moved according to a certain ratio, in a certain time, it is necessary that in this time the motion should be according to a right line, from what has been already shown. And hence that which is moved with two motions in no ratio, and in no time[3], [i. e. when there is no difference in the time of the two motions,] will be circularly moved."

Nor must it be said with Dr. Gregory, " that if the number of the triangles are supposed to be augmented, and their breadth to be diminished in infinitum, their bases will form a curve line, concave towards the same parts, and lying in the same plane." For even admitting it to be possible for a polygon to exist with an infinite number of sides, (though in my Elements of the True Arithmetic of Infinites, I have demonstrated it to be impossible[4],) and that the ambit of such a polygon may be considered as equal to the curve in which it is inscribed; yet that which Dr. Gregory asserts will no longer necessarily follow, viz. that when the centripetal force which before acted, as it were, by starts, and at great intervals of time, when it described the polygon, now acts constantly in describing the curve; the areas thus described will be as before, proportional to the times of description. For, as Aristotle has shown, in this case there will no longer be any ratio or difference of time in the two motions; and therefore the same consequence will not follow when there is not this ratio as when there is.

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[3] φανερον ουν οτι το κατα την διαμετρον φερομενον εν δυο φοραις, αναγκη τον των πλευρων φερεσθαι λογον. ει γαρ αλλον τινα, ουκ οισθησεται κατα την διαμετρον. εαν δε εν μηδενι λογῳ φερεται δυο φορας κατα μηθενα χρονον, αδυνατον ευθειαν ειναι την φοραν. εστω γαρ ευθεια. τεθεισης ουν ταυτης διαμετρου, και παραπληρωθεισων των πλευρων, αναγκη τον των πλευρων λογον φερεσθαι το φερομενον. τουτο γαρ δεδειχθαι προτερον. ουκ αρα ποιησει ευθειαν το εν μηδενι λογῳ φερομενον μηδενα χρονον. εαν γαρ τινα λογον ενεχθῃ εν χρονῳ τινι, τουτον αναγκη τον χρονον ευθειαν ειναι φοραν δια τα προειρημενα, ωστε περιφερες γινεται, δυο φερομενον φορας εν μηθενι λογῳ μεθενα χρονον.

[4] In p. 43 of my Elements of the True Arithmetic of Infinites, I observe, " That the supposition of a polygon of an infinite number of sides is attended with a very great absurdity: for, independent of the arguments by which Aristotle shows that the infinite in quantity exists only in capacity, and not in energy, if there could be such a thing as a polygon of an infinite number of sides, the number of these sides would be equal to $\frac{1}{1-1}$; but each side of this polygon is the chord of an arch of the circle in which the polygon may be inscribed. Each of the arches, therefore, being bisected,

The second proposition of the first book of the Principia, and which is the twelfth of Dr. Gregory's Elements, is, "That a body moved in a curve line described upon a plane, and concave towards the same parts and by a radius drawn to an immoveable point situated in the same plane towards the concavity of the curve, describing areas proportional to the times, is urged by a centripetal force tending to that point" This proposition is inconclusive; for admitting that a body, urged by a

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bisected, which the chords of the polygon subtend, another polygon may be inscribed in the same circle, consisting of twice the number of sides of which the former polygon consists. But this is impossible; for it has been demonstrated that the number of sides cannot be greater than $\frac{1}{1-1}$."

Independent of this demonstration also, it is evident that there cannot be a polygon of an infinite number of sides, from the following consideration, that if there could be such a polygon, and it is conceived to be unbent into a right line, there would be a right line, with an *actual* infinite number of parts, whereas a right line only contains infinite parts in *capacity*.

This erroneous hypothesis, however, of modern mathematicians, has arisen from supposing that an infinitesimal is still quantity, though infinitely small; and hence they have introduced into geometry infinitely little lines, surfaces, and solids. But as I have demonstrated in my Arithmetic of Infinites, an infinitesimal is no longer quantity, but is non-quantitive. Thus if 1 be divided by $\frac{1}{1-1}$, $\frac{1}{1-2+1}$, or any other expression which may be expanded into an infinite series, it is evident that the quotient $1-1$, or $1-2+1$, &c. is non-quantitive. But modern mathematicians have not perceived this, in consequence of employing the symbol ∞ for the infinitely great in their reasonings, instead of making use of $\frac{1}{1-1}$, or $\frac{1}{1-2+1}$, or $\frac{1}{1-2}$, or some other expression, which, when expanded, produces an infinite series. For if 1 is divided by ∞, the quotient is $\frac{1}{\infty}$, which merely denotes a fraction having unity for its numerator, and an infinite quantity for its denominator.

centripetal force, described a curve, and areas proportional to the times, it does not necessarily follow, that every body describing such a curve, and such areas, is urged by a centripetal force; for all that can be said in this case is, that it may be urged by such a force, and that it may arise from a very different cause. Thus, for instance, a ship carried in a stream, and a man walking on the ground, may easily be supposed to describe, round some body or other, areas proportionable to the times, to as great exactness as any man, from observation, can affirm that the planets do. The force that moves the ship is the pressure of the particles of water upon her sides, in many millions of directions; and the force that moves the body of the man, is the action of his will on his animal spirits, which contract his muscles in as many directions. Now what conception can any one have of these two very different causes, from being told that the whole forces by which those motions are performed, when joined together, are equal to one force directed to that body, round which the ship, or the man's body, describes areas proportionable to the times? And what little reason have we from this to conclude those very different causes to be alike? What a ridiculous thing also would it be to infer from this, that the ship or man, is attracted by some power proceeding from those bodies, round which they described such curves, and that this attraction is the cause of their motion? And yet Newton and Gregory have no better reason from this proposition to conclude that the planets are moved by the attraction of that body, which is in the centre, or in one of the foci of their orbits.

But the greatest objection to this hypothesis is, that the motion of the planets through the action of this centripetal force, will be violent and not natural. For as the planets, according to Newton, are of the same nature with earthly bodies, a rectilinear and not a curvilinear motion is natural to them. Hence, if they are thus moved, they are moved contrary to nature. But, as Aristotle observes, the motion which is contrary to nature is posterior to that which is according to nature. For that which is contrary implies the prior existence of that which is according to nature. Hence, if the planets have always been moved by violence, they have always been moved contrary to nature, at

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the same time possessing a natural motion, which has never been exerted, but perpetually counteracted. God and nature, however, do nothing in vain. By the strength of this argument alone of Aristotle, the centripetal and centrifugal forces, which, like the Aloidæ, have with giant-pride so long invaded the heavens, are vanquished, and hurled into their native abode, the sublunary realms.

CHAPTER VII.

Let us in the next place direct our attention to what is said by Newton, and the best of his commentators, Gregory, concerning attraction; for we shall find that there is not any theory upon record more futile and extravagant than the Newtonian theory of this power, though it is the bond which holds the whole of that philosophy together.

We are informed then by Newton[5], that every the least possible particle of matter or body, attracts all bodies at all distances; and that the being, whatever it is, that performs attraction, or impels bodies towards each other, proceeds from those bodies to which it belongs, and penetrates the whole substance of the bodies on which it acts. Dr. Gregory says, that the virtue or power which performs attraction, is like light, heat, &c. spread from a centre every way through the surrounding space equally; so that when spread through a larger space, it is less in any part of that space, because more dilated (diffusa et sparsa), and when spread through a less space, there is more of it in an equal part of that space, because there it is more pent up (constipata), and that the quantity of this virtue that is contained in any part of a greater space, is to the quantity of it that is contained in an equal part of a less space, as the spaces themselves.

According to this theory, therefore, the mysterious power that performs attraction proceeds from the smallest possible particle of matter equally all around, and extends as far as the limits of the universe; so that to every particle of matter there belongs a sphere of this being, equal in bulk to the extent of the universe. The quantity of this being that is pent up in any part of those spheres near their centre, is to the quantity of it which is in an equal part near the surface in a duplicate ratio of the distances of those places from the centre of the sphere; and yet since this particle attracts every other particle in nature, there must not be the least pore in this sphere, even near its surface, where the smallest particle of matter could be free from its influence. Indeed, this being must fill even the most distant spaces so perfectly, as to penetrate the whole substance of those bodies by which any of it is occupied. Since, likewise, every the least particle of matter must have belonging to it such a sphere as this, it is evident that every one of these spheres must penetrate each other, as well as they do bodies, and thus the universe will be filled with an innumerable multitude of such spheres. This extravagant number of spheres, of such an enormous bulk, and consisting of a being of such a strange and mysterious nature, is that by which, according to the Newtonian philosophers, some of the most considerable phenomena of nature are performed.

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[5] Princip. Prop. 6, 7, and 8, Lib. 3.

Is it not strange after all this to find Newton asserting, "*that he does not devise hypotheses,*" (et hypotheses non fingo), and that the etherial spheres of Aristotle, in which the planets are carried, are to be broken as things entirely useless? For it appears to me that these spheres of attraction are not only hypothetical, but almost as extravagantly so, as the atoms of Epicurus falling from all eternity through an infinite void. For admit only that the atoms of Epicurus are but instrumental causes, as well as the spheres of Newton, and the one system is just as vague as the other with respect to the proximate cause of their agency; since neither the former nor the latter of these philosophers attempts to assign what this cause is. Newton, indeed, from an inability to discover the proximate cause of attraction, flies to the first cause of all things, and thus having no knowledge of the agency of intermediate incorporeal causes, asserts what even a child would say, that the cause of attraction is God. For all things, indeed, proceed from divinity, as their primary cause; but to the subsistence of all that variety of effects with which the universe is replete, the co-operation of other subordinate causes is necessary, not through any imbecility in divinity, but on the contrary through transcendency of productive power. For if he produced this visible universe without the intervention of other causes, the whole of it would be as much as possible similar to himself, viz. it would be secondarily what he is primarily; since in immediate productions, when they are the result of essential energy, the effect is transcendently similar to the cause. Thus the heat immediately proceeding from a fire, possesses that heat in a secondary which the fire possesses in a primary degree; thus snow possesses cold primarily, and imparts it secondarily; and after this manner soul possesses life and imparts it to the body. Hence, if the universe was the immediate progeny of deity, it would possess in a secondary degree the characteristics of deity, viz. the ineffable, and the superessential, and in short an essence superior to that which is simply incorporeal; for the immediate energy of deity is deific, in the same manner as that of fire is calorific.

Newton, therefore, from having no knowledge of those incorporeal causes which subsist between the principle of all things and matter, was led to consider the universe as a machine, first set in motion by divinity, and which continues to move by the forces which he continually and immediately presses upon it. Hence, he had no other conception of divinity than that of a being resembling nature, which being merged in corporeal masses, and inseparable from them, inspires them with her productive powers. All this ignorance too, and the gross absurdities into which he was led by it, originated from conceiving that the most minute parts in the universe are animated, but that the great wholes of which it consists are inanimate. He is not, however, singular in this fatuity; since the same opinion has prevailed, in Europe at least, for many centuries; though analogy, it might be supposed, would have persuaded those who attempted to philosophize, that wholes must be animated by a much greater necessity than parts; especially when the former are incorruptible, and the latter are subject to unceasing mutation and decay. For how can man be a microcosm unless the world is one vast animal? And if the world is an animal, every thing that exists in it is more or less animated, just as every part of the human body is more or less vitalized. The more honourable parts of the world also must have an animation superior to the less honourable, and wholes are more honourable than parts, or the order of things would be subverted, and the universe would resemble a perfect democracy, or rather ochlocracy, or the government of a mob.

Admitting, therefore, the planets to be animated bodies, and that a circular or elliptical motion is imparted to those bodies by their informing souls, such a motion becomes natural to them, and all the difficulties with which the hypothesis of Newton is pressed immediately vanish; as it will then be just as easy to account for this motion as for that of the chariot of the Grecian youth, which, through the skill of its driver, moved invariably in the same circular track.

I confess I am wholly at a loss to conceive what could induce the moderns to controvert the dogma, that the stars and the whole world are animated, as it is an opinion of infinite antiquity, and is friendly to the most unperverted, spontaneous, and accurate conceptions of the human mind. Indeed, the rejection of it appears to me to be just as absurd as it would be in a maggot, if it were capable of syllogizing, to infer that man is a machine impelled by some external force when he walks, because it never saw any animated reptile so large.

The sagacious Kepler, for so he is called even by the most modern writers[6], appears to have had a conception of this great truth; but as he was more an astronomer than a philosopher, he saw this truth only partially, and he rather embraced it as subservient to his own astronomical opinions, than as forming an essential part of the true theory of the universe. But from what I have seen of the writings of Kepler, I have no doubt, if he had lived in the time of the Greeks, or if he had made the study of the works of Plato and Aristotle the business of his life, he would have become an adept in, and an illustrious and zealous champion of their philosophy. Kepler then (in Harmonices Mundi, lib. 4, p. 158) says, " That he does not oppose the dogma, that there is a soul of the universe, though he shall say nothing about it in that book. He adds, that if there is such a soul, it must reside in the centre of the world, which, according to him, is the sun, and from thence by the communication of the rays of light, which are in the place of spirits in an animated body, is propagated into all the amplitude of the world[7]." In the following passages also he confidently asserts that the earth has a soul. For he says, " That the globe of the earth is a body such as is that of some animal; and that what its own soul is to an animal, that the sublunary nature which he investigates will be to the earth[8]." He adds, " That he sees for the most part every thing which proceeding from the body of an animal testifies that there is a soul in it, proceeds also from the body of the earth. For as the animated body produces in the superficies of the skin hairs, thus also the earth produces [on its surface] plants and trees; and as in the former lice are generated, so in the latter the worms called erucæ, grasshoppers, and various insects and marine monsters, are produced. As the animated body likewise produces tears, mucus, and the recrement of the ears, and sometimes gum from the pustules of the face, thus also the earth produces amber and bitumen. As the bladder too produces urine, thus likewise mountains pour forth rivers. And as the body produces excrement of a sulphureous odour, and crepitus, which may also be inflamed, so the earth produces sulphur, subterranean fires, thunder, and lightning. And as in the veins of an animal blood is generated, and together with it sweat, which is ejected out of the body, so in the veins of the earth, metals and fossils, and a rainy vapour are generated[9]." And in cap. 7, p. 162, after having shown that there is in the earth the sense of touching, that it respires and is subject in certain parts to languors, and internal vicissitudes of the viscera, and that subterranean heat proceeds from the soul of the earth, he adds, "That a certain image of the zodiac is resplendent in this soul, and therefore of the whole firmament, and is the bond of the sympathy of things celestial and terrestrial[1]."

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[6] Dr. Gregory, in the 70th proposition of the first book of his Elements of Astronomy, says of Kepler, " That his archetypal ratios, geometrical concinnities, and harmonic proportions, show such a force of genius as is not to be found in any of the writers of physical astronomy before him. So that Jeremiah Horox, a very competent judge of these matters, though a little averse to Kepler, in the beginning of his astronomical studies, after having in vain tried others, entirely falling in with Kepler's doctrine and physical reasons, thus addresses his reader: *Kepler is a person whom I may justly admire above all mortals beside: I may call him great, divine, or even something more; since Kepler is to be valued above the whole tribe of philosophers. Him alone let the bards sing of. —Him alone let the philosophers read; being satisfied of this, that he who has Kepler has all things.*"

I quote this passage, not from the justness of the encomium it contains, for it is extravagant, and by no means true; but that the reader may see what an exalted opinion some of the greatest of the moderns have had of the genius of Kepler.

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[7] " Et primum quidem de anima totius universi etsi non repugno, nihil tamen hoc libro IV. dicam. Videtur enim (si est talis aliqua) in centro mundi, quod mihi sol est, residere, indeque in omnem ejus amplitudinem commercio radiorum lucis, qui sint loco spirituum in corpore animali propagari."

[8] " Denique terræ globus tale corpus erit, quale est alicujus animalis: quodque animali est sua anima, hoc erit telluri hæc, quam quærimus, natura sublunaris."

Berkeley also, *though a Bishop!* was by no means hostile to this opinion, that the world is one great animal, as is evident from the following extract from his Siris (p. 31).

"Blind fate and blind chance are at bottom much the same thing, and one no more intelligible than the other. Such is the mutual relation, connection, motion, and sympathy of the parts of this world, that they seem, as it were, animated and held together by one soul: and such is their harmony, order, and regular course, as shows this soul to be governed and directed by a mind. It was an opinion of remote antiquity that the world was an animal. If we may trust the Hermaic writings, the Ægyptians thought all things did partake of life. This opinion was also so general and current among the Greeks, that Plutarch asserts all others held the world to be animal, and governed by Providence, except Leucippus, Democritus, and Epicurus. And although an animal containing all bodies within itself, could not be touched or sensibly affected from without; yet it is plain they attributed to it an inward sense and feeling, as well as appetites and aversions; and that from all the various tones, actions, and passions of the universe, they supposed one symphony, one animal act and life to result.

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[9] "Videbam pleraque omnia, quæ ex corpore animantis provenientia, testantur animam in illo inesse, provenire etiam ex telluris corpore. Ut enim corpus in cutis superficie pilos, sic terra plantas arboresque profert; inque iis ibi pediculi, hic erucæ, cicadæ, variaque insecta et monstra marina nascuntur: et ut corpus lachrymas, blennam, auriumque recrementa, est ubi et gummi ex faciei pustulis, sic tellus electrum, bitumen: utque vesica urinam: sic montes flumina fundunt; et ut corpus excrementum sulphurei odoris, crepitusque, qui etiam inflammari possunt, sic terra sulphur, ignes subterraneos, tonitrua, fulgura: utque in venis animantis generatur sanguis, et cum eo sudor, extra corpus ejectus; sic in venis terræ, metalla et fossilia, vaporque pluvius."

[1] "Relucet igitur in anima telluris, imago quædam circuli zodiaci sensibilis, totuisque adeo firmamenti, vinculum sympathiæ rerum cælestium et terrestrium."

"Iamblichus declares the world to be one animal, in which the parts, however distant each from other, are nevertheless related and connected by one common nature. And he teaches, what is also a received notion of the Pythagoreans and Platonics, that there is no chasm in nature, but a chain or scale of beings rising by gentle uninterrupted gradations from the lowest to the highest, each nature being informed and perfected by the participation of a higher. As air becomes igneous, so the purest fire becomes animal, and the animal soul becomes intellectual, which is to be understood, not of the change of one nature into another, but of the connection of different natures, each lower nature being, according to those philosophers, as it were, a receptacle or subject for the next above it to reside and act in.

"It is also the doctrine of Platonic philosophers, that intellect is the very life of living things, the first principle and exemplar of all, from whence, by different degrees, are derived the inferior classes of life; first the rational, then the sensitive, after that the vegetable, but so as in the rational animal there is still somewhat intellectual, again in the sensitive there is somewhat rational, and in the vegetable somewhat sensitive, and lastly in mixed bodies, as metals and minerals, somewhat of vegetation. By which means the whole is thought to be more perfectly connected. Which doctrine implies that all the faculties, instincts, and motions of inferior beings, in their several respective subordinations, are derived from, and depend upon, intellect.

"Both Stoics and Platonics held the world to be alive, though sometimes it be mentioned as a sentient animal, sometimes as a plant or vegetable. *But in this, notwithstanding what has been surmised by some learned*

learned men, there seems to be no atheism. For so long as the world is supposed to be quickened by elementary fire or spirit, which is itself animated by soul, and directed by understanding, it follows that all parts thereof originally depend upon, and may be reduced unto, the same indivisible stem or principle, to wit, a supreme mind; which is the concurrent doctrine of Pythagoreans, Platonics, and Stoics."

Compare now the Newtonian with this theory, that the heavenly bodies are vitalized by their informing souls, that their orderly motion is the result of this vitality, and that the planets move harmonically round the sun, not as if urged by a centripetal force, but from an animated tendency to the principle and fountain of their light, and from a desire of partaking as largely as possible of his influence and power. In the former theory all the celestial motions are the effect of violence, in the latter they are all natural. The former is attended with insuperable difficulties, the latter, when the principle on which it is founded is admitted, with none. And the former is unscientific and merely hypothetical; but the latter is the progeny of the most accurate science, and is founded on the most genuine and unperverted conceptions of the human mind.

CHAPTER VIII.

If, however, it be requisite to show summarily the very scientific manner in which this theory of the ancients is deduced, it is as follows: The cause of all things is void of all multitude, and is all-perfectly one. For if he had any multitude there must be some cause prior to him, and this must be *the one*, since multitude is indigent of unity to its subsistence. The first cause likewise is goodness itself; for that which is the first must be the most excellent of all things, and there is not any thing more excellent than goodness. So far, therefore, as he is *the one*, he is the cause of all things; and so far as he is *the good*, he is the object of desire to all things. As he is *the one* likewise, and the universe proceeds

ceeds from him, the universe must be as much as possible one. For in consequence of energizing according to unity, in which his very nature consists, his offspring, the universe, must be united; since *oneness* necessarily proceeds from *the one*, in the same manner as heat from fire, and life from the soul. It must also be exquisitely united; for thus it will become as similar as possible to its cause, and being thus assimilated, will be as excellent as possible, since goodness and unity are one and the same.

Divinity, therefore, having produced all that could possibly be produced in consequence of being *goodness itself*, and having exquisitely united all things in consequence of being *the one itself*, he produced the similar prior to the dissimilar; for thus only every thing could exist that was capable of existing, and thus only all things could be as much as possible one. But if the similar has a subsistence prior to the dissimilar, the procession of things from their ineffable principle must be consummately gradual: and this can only take place, by the extremity of a superior coalescing with the summit of an inferior order. As the principle of all things, therefore, is superessential, the first of beings, from participating largely of their principle, will be superessential, *κατα σχεσιν*, according to habitude, proximity or alliance; the highest intellects will be beings; the first of souls will after this manner be intellects; and the highest bodies' lives, on account of their being wholly absorbed as it were in a vital nature[2]. The body of the world, and the celestial orbs, are bodies of this kind, viz. they are triply extended substances, which, from partaking so largely of vitality, have nothing of the density or gravity of sublunary bodies, but compared with them may be said to be of an immaterial nature. Hence, the sovereign Architect of this vast temple the universe, did not, like human architects, in fabricating begin at the bottom, but he began at the roof and built downward, and thus suspended the inferior parts of the world from the superior. The roof, therefore, as being the highest part of the building, is most adapted to receive the beneficent illuminations of its divine architect: and to this the heavens are analogous. The pillars next succeed; and these are the incorporeal powers, and the different media that connect and yet separate heaven and earth; for such is the nature of a pillar, it unites, and at the same time separates. It is to these pillars that Homer alludes, when, speaking of Atlas, he says,

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[2] Hackney writers, Reviewers, and the whole rabble of book-makers, will, doubtless, from not in the least understanding what is here said, endeavour by misrepresentation to make it appear ridiculous. I do not however write for such as these, or their readers, since, in the language of Diogenes, I appeal to *men* and not to *scum* (*ανθρωπους εκαλεσα ου καθαρματα*, Diog.).

And the long pillars which on earth he rears,
End in the starry vault, and prop the spheres.

But the basis of this august temple is, in the language of the poets, the wide-bosomed earth, and the circumfluent sea.

Such is the order of things proceeding from divinity to the earth, according to the pious philosophy of Aristotle and Plato. It is far otherwise with the philosophy of Newton. For in this, Divinity in fabricating the universe began from the earth, and the temple of the world (if in this system it can be called a temple) is wholly composed of earthly and sublunary materials. There is no distinction in it of first and last; for the roof of the temple is as much a foundation as a roof, and, vice versa, the foundation is as much the roof as a foundation. As there is no connection too in the building, there are consequently no pillars; so that the universe on this system is an inexplicable structure, without order and devoid of art, displaying no wisdom in its contrivance, and no unity in its parts.

Even a writer of a very recent date, who, from his abuse and ignorance of the philosophy of Aristotle, ranks high among the most genuine moderns, objects to the theory of forces by which Newton endeavours to solve the motions of the planets. What he says on this subject is as follows:

"To investigate and assign the true causes of things, is a much more hazardous task than philosophers are willing to allow. Because the curve described by a planet is of the same species, and the motion similar to those of a projectile; to infer that, therefore, the cause is actually,

tually the *same*, is a conclusion more than the *analogy*, on which Newton's astronomy is founded, either requires or warrants; for the *curves* of both are the *same* with that produced by the simple act of cutting a piece of wood of a certain shape in a certain direction, and it cannot be, therefore, argued that the *causes* are the same." He adds, "That the first cause of all motion, projectile or astronomical, incessantly acting in his providential care, according to general laws, is one and the same, is most true: But whether he may not *move* the grander wheels of his material system by a more *immediate act* of his omnipotent mind, whilst he produces the *same apparent effects* or *similar motions* on this earth by the operation of *second causes*; or whether he does not produce the heavenly motions by second causes, either *different in themselves*, or *compounded differently*, from those which act on projectiles, as no experiments can be instituted in these distant regions, are points worthy the consideration of a philosopher.

"But there are many motions upon the earth different from that of projectiles, which may probably lay the foundation of an analogy to the celestial motions; as that of *fire*, which is directly opposite to *gravitation*. We have heard of a foreigner who is projecting an astronomy on the principle of *repulsion*: and our own countryman, the ingenious Mr. Jones, has assigned a principle of planetary motion grounded on experiment, totally different from the Newtonian forces; and which if the *real causes* are to be given, is much more *simple*, and in many respects less objectionable."

"He further observes, that Newton to establish his *projection* or *centrifugal force*, according to his first axiom, was obliged to invent a perfect vacuum. But then for his *gravitation* or *centripetal force*, a vacuum would not do; and he was brought to great difficulties, [see his letter to Dr. Bentley,] and at last to the necessity of conjecturing a *subtle etherial fluid*, as a medium to pervade the universe. [See Opt. Quæst. 18, 19, 20, 21.] And thus, says Mr. Jones, he solved the government of the world by a *nostrum*, which has never yet been understood[3]."

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[3] Chart. and Scale of Truth, Vol. I. p. 166.

Bishop Berkeley, likewise, remarks in his Siris, "That what is said of forces whether *attracting* or *repelling*, is to be regarded only as a *mathematical hypothesis*, and not any thing existing in nature." The theory of Newton, however, would not be objectionable for being merely a mathematical hypothesis, if this hypothesis were possible in the nature of things, though it did not actually exist; but because it supposes the planets to be continually moved by violence, which is a thing utterly impossible, for the reasons before assigned, it can by no means be admitted. For the ancients did not consider their astronomical hypothesis as realities, but as things possible, since, as it is well observed by Simplicius, "Aristotle grants that the planets are moved with multiform motions, not only on account of their apparent advancing motions, but also from their retrogradations, stations, and all various irregularities. For in order to solve these, astronomers have assumed many motions according to each, some supposing eccentric circles and epicycles, and others what are called concentric evolvents. In reality, however, we must not admit that there are any stations, or retrogradations, or additions or ablations, in their motions.• And if they appear to be thus moved, Aristotle does not admit the hypothesis as thus subsisting; but arguing from their essence he shows that their motions are simple, circular, equable and orderly. Not being able, however, accurately to arrive at the manner in which they are disposed; *for the accidents which apparently belong to them are in the phantasy only, and have no real existence*; he is satisfied with discovering such hypotheses as, through equable, orderly and circular motions, may be able to solve the phænomena about the motions of the planets."

Simplicius farther observes, "that Eudoxus the Cnidian, was the first of the Greeks, (as Eudemus relates in the second book of his Astronomical History, and Sosigenes, who received this information from Eudemus,) who employed such like hypothesis; Plato, as Sosigenes says, proposing as a problem to those who are studious of these things, from what hypothesis of orderly and equable motions, the phænomena about the motion of the planets may be preserved. Plato, indeed, in his Laws, seems to say, that the planets appear to be thus variously moved, yet are not so moved in reality. But in the Timæus he grants that the motion of them is more different, as having a middle subsistence between things perfectly orderly, and things perfectly deprived of order, and on this account possessing an orderly irregularity. Hence, in the Laws he exclaims against those who ascribe to them a wandering motion alone, and who do not think that they participate of order, and that arrangement is natural to them[4]."

Proclus also, (in Tim. p. 284,) observes, "That it requires to be well considered, whether according to Plato, the planets are not at all in want of any such contrivances, [as eccentric circles, epicycles, &c.] as being unworthy of a divine essence; and that the variety of their motions ought to be suspended from their souls, the bodies of the planets being moved swifter or slower according to the will of their informing souls[5]." As Proclus, therefore, remarks in another part of the same admirable work—"We may see the order of the motions of the heavenly bodies from things themselves. For the motion of the universe is uniform, that of the fixed stars is biform, and that of sublunary bodies is multiform and indefinite. Each of the planets also is moved with a uniform motion, but the commixture of many periods, of that which is appropriate to each planet, and of that which is in conjunction with the inerratic sphere, renders their motion various. For it is necessary that the causes of variety, and the principles of contrariety should be comprehended in the heaven. Or how can the heaven comprehend in itself the sublunary region, or how can it govern the mutation of the sublunary elements, unless it contains in itself the cause of contrariety? But since the heaven is immaterial, as much as it is possible for that which is sensible to be so, contraries in it are not hostile to each other; but they are co-existent, and the same thing is moved with twofold circulations, one of which is not essential and the other accidental; for both of them are essential. And hence, both figure and motion there are essential[6]."

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[4] See my translation of Aristotle's treatise On the Heavens, p. 226.

[5] παλιν γαρ τα δοκουντα λεκτεον πολλης επιστασιας δεομενα, μηποτε ο Πλατων αυτους τους αστερας κινει διαφορως, ουδεν δεομενος των τοιουτων μηχανηματων ως αναξιων της θειας ουσιας, και δει την ποικιλιαν αυτην εξαπτειν της κινησεως των ψυχων, κατα την εκεινων βουλησιν, θαττον ἢ βραδυτερον κινουμενων των σωματων.

CHAPTER IX.

In the preceding chapter, it was observed from Simplicius, *that the accidents which apparently belong to the planets are in our phantasy only, and have no real existence.* That this is really the case both with the planets and fixed stars, the following extracts from Dr. Herschel, the most celebrated of modern astronomers, abundantly evince, though neither Newton nor any of his followers have the smallest conception that it is so.

In the first place, then, the Dr. in his treatise On the Nature, &c. of the Sun, in the Philosophical Transactions for 1795, observes as follows:

"The dark spots in the sun have been supposed to be solid bodies revolving very near its surface. They have been conjectured to be the smoke of volcanoes, or the scum floating upon an ocean of fluid matter. They have also been taken for clouds. They were explained to be opaque masses swimming in the fluid matter of the sun, dipping down occasionally. It has been supposed that a fiery liquid surrounded the sun, and that by its ebbing and flowing, the highest parts of it were occasionally uncovered, and appeared under the shape of dark spots; and that by the return of this fiery liquid they were again covered, and in that manner successively assumed different phases. The sun itself has been called a globe of fire, though perhaps metaphorically. The waste it would undergo by a gradual consumption, on the supposition of its being ignited, has been ingeniously calculated. And in the same point of view, its immense power of heating the bodies of such comets as draw very near to it, has been assigned.

"The bright spots or faculæ, have been called clouds of light, and luminous vapours. The light of the sun itself has been supposed to be directly invisible, and not to be perceived unless by reflexion; though the proofs which are brought in support of that opinion, seem to me to amount to no more, than what is sufficiently evident, that we cannot see when rays of light do not enter the eyes. August 26, 1792, I examined the sun with several powers from 90 to 500. It appears evidently that the black spots are the opaque ground or body of the sun; and that the luminous part is an atmosphere which, being interrupted or broken, gives us a transient glimpse of the sun itself. My seven feet reflector, which is in high perfection, represents the spots, as it always used to do, much depressed below the surface of the luminous part.

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[6] In Tim. p. 277.

"That the sun has a very extensive atmosphere cannot be doubted; and that this atmosphere consists of various elastic fluids, that are more or less lucid and transparent, and of which the lucid one is that which furnishes us with light, seems also to be fully established by all the phænomena of its spots, of the faculæ, and of the lucid surface itself."

Dr. H. supposes, (p. 59,) that the continual and very extensive decompositions of the elastic fluids of the sun, are of a phosphoric nature, and attended with lucid appearances by giving out light. In answer to the objection that such violent and unremitting decompositions would exhaust the sun, he says that every other ingredient but light may return to the body of the sun. He adds, "And that the emission of light must waste the sun is not a difficulty that can be opposed to our hypothesis. For as it is an evident fact that the sun does emit light, the same objection, if it could be one, would equally militate against every other assignable way, to account for the phænomenon." He further observes, "We know the exceeding subtilty of light to be such, that in ages of time its emanation from the sun cannot very sensibly lessen the size of this great body. To this may be added, that very possibly, there may also be ways of restoration to compensate for what is lost by the emission of light, though the manner in which this can be brought about should not appear to us. Many of the operations of nature are carried on in her great laboratory, which we cannot comprehend; but now and then we see some of the tools with which she is at work. We need not wonder that their construction should be so singular as to induce us to confess our ignorance of the method of employing them, but we may rest assured that they are not a mere lusus naturæ."

I appeal to every intelligent and impartial reader, whether any thing can more strongly bear the marks of *delusive imaginations* than what those moderns prior to Dr. Herschel, and the Doctor himself, have written concerning the sun, and have conceived they beheld in it. Can any thing be more absurd than the hypothesis of Dr. H., that the sun is an opaque body with a luminous atmosphere? For whence does such an atmosphere derive its light; since it cannot be from the body of the sun? What is the nature of this atmosphere? For if it is material like that of the earth, its light must have been exhausted long ago. The difficulty of replying to these questions is so great, that the Doctor is reduced to the necessity of observing, *that very possibly there may be ways of restoration to compensate for what is lost by the emission of light, though the manner in which this can be brought about should not appear to us.* And he consoles us at last by the information, *that though we are ignorant of these operations of nature, we may rest assured they are not a mere lusus naturæ.* Is the whole of this any thing more than delusive vision, and idle conjecture which ends in nothing?

Compare now these conjectures of Dr. Herschel with the sublimely scientific theory of Plato respecting the sun, with which Aristotle also accords. For in the 6th book of the Republic, he says, "That *the good*, or the supreme principle of things generated the sun analogous to itself; and that what *the good* is in the intelligible place, with respect to intellect and the objects of intellect, that the sun is in the visible place with respect to sight and visible things." For as the sensible is the image of the *intelligible* world, every thing in the former must be analogous to every thing in the latter. Hence, Plato justly infers that the sun is analogous to *the good*, and that *light* and *sight* which are solarform, correspond to *truth* and *knowledge*. And that as things which are known have not only this from *the good* that they are known, but likewise derive from thence their being and essence, whilst *the good itself*

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is not essence, but beyond essence, transcending it both in dignity and power; so the sun imparts to things which are seen, not only their visibility, but likewise their generation, growth and nourishment, not being itself generation; viz. not having a flowing subsistence subject to renovation and decay. Hence according to Plato the sun alone of all things in the universe which are connected with a body is without generation, neither receiving any accession nor diminution of light. But every thing else which it illuminates receives light from a different part of it, through the motion of the solar sphere about its proper centre, which at different times sends different rays in a circle to the celestial and sublunary bodies. The sun therefore so far as it illuminates is without generation, and according to this is assimilated to *the good*, and not so far as it is a body.

In the Timæus also Plato says, "In order that the motion of the eight circulations might be manifest, the Divinity enkindled a light which we now denominate the sun, in the second revolution from the earth; that the heavens might become eminently apparent to all things, and that such animals might participate of number as are adapted to its participation, receiving numerical information from the revolution of a nature similar and the same." Hence as Proclus in commenting on this passage beautifully observes, "The order of the sun proceeds supernally from supermundane natures, and therefore Plato does not give subsistence to its light from a certain place, but says that the demiurgus enkindled it, as forming this sphere from his own essence, and emitting from the solar fountain in himself a divulsed and nascent life. "He adds, "On this account also, Plato appears to me to deliver a twofold generation of the sun; one together with the seven governours of the world, when he fashions their bodies, and places them in their revolving spheres; but the other the *enkindling* of its light, according to which he imparts to it supermundane power. For it is one thing to generate itself by itself, the whole bulk of the sun, and another to generate it together with a governing characteristic, through which it is called the king of every thing visible, and is established as analogous to the one fountain of good. For as *the good itself*, being better than *the intelligible*,

telligible, illuminates both intellect and the intelligible, so the sun being better than the visible essence, illuminates sight and whatever is visible. But if the sun is above the visible essence, it will have a supermundane nature; for the world is visible and tangible, and possesses a body." Proclus afterwards, near the end of his commentary on this part, farther observes, "That if by the heavens here we understand that which is moved in a circle, the sun does not illuminate the whole of this: for there are shadows there, through the obscurations of the stars and moon. But nothing in the world is pure from shadow, (as neither is there any thing mundane pure from matter, supermundane natures alone being without shadow and immaterial,) except the sun. Hence, the sun is truly shadowless, and without generation, every thing else receiving at different times different illuminative additions[7]." The most scientific analogy therefore requires, that there should be something in the sensible world analagous to the supreme principle of things, and this can alone be the sun.

Again, Dr. Herschel in his Astronomical Observations on the Construction of the Heavens, read to the Royal Society, June 20th, 1811, says, "If it should be remarked, that in this new arrangement I am not entirely consistent with what I have already in former papers said on the nature of some objects that have come under my observation, I must freely confess, that by continuing my *sweeps* of the heavens, my opinion of the arrangement of the stars and their magnitudes, and of some other particulars, has undergone a gradual change; and indeed when the novelty of the subject is considered, we cannot be surprised that many things formerly taken for granted, should on examination prove to be different from what they were generally but incautiously supposed to be." This is obviously a *sweeping* recantation of former opinions, and clearly shows that what the Doctor thought he had before seen in the heavens was merely *imaginary*.

In p. 274, he observes: "Extensive diffusions of *nebulosity* can only be seen when the observer has been in the dark long enough for the eye to recover from the impression of having been in the light." Of this there can be no doubt; for to see what Dr. Herschel fancies he has seen, it is necessary to abandon the light, and to have been for a long time in the dark.

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[7] See p. 496 of my translation of the Timæus, in vol. 2, of my Plato.

Again, in p. 277, he says, "By nebulous matter, I mean to denote that substance, or rather those substances, which give out light, whatsoever may be their nature, or of whatever different powers they may be possessed." This definition is surely unparalleled for its absurdity. For according to this, every luminous body, the sun and the fixed stars, are nebulous matter. And yet he afterwards says, "That the stars of the milky way appeared with a brilliancy that will admit of no comparison with the dimness of the brightest nebulosity."

And in p. 329, he owns, *that the sweeping power left him rather doubtful;* which surely is not at all wonderful.

Telescopes, as they were the means of discovering these appearances in the heavenly bodies, have also induced astronomers to believe that they have a real existence, though they ought to have led them to a suspicion at least of their reality. For it is well known, that as the magnifying power of telescopes is increased, the distinctness of the objects seen through them is diminished; and when together with this the prodigious distance of even the nearest of the heavenly bodies is considered, and the impossibility of inspecting them closely, as we can objects on the earth, all the information that can be obtained through the assistance of telescopes respecting these bodies, must be very dubious, and therefore can never become the basis of any scientific conclusions. From the testimony of Dr. Herschel himself it is evident that the great curvature of the eye-glasses that give very high powers, may occasion deception. For in his Observations On the Figure, &c. of Saturn, in the Philosophical Transactions for 1806, he says, "that the magnifying power is gradually to be lowered, in order to be assured that the great curvature of the eye-glasses giving these high powers, has not occasioned any deceptions in the figure to be investigated." And in the Philosophical Transactions for 1808, p. 160, 161, he acknowledges, "that the uncommon flattening of the polar regions of Saturn in his 40-feet telescope is an *illusion* [8].

CHAPTER X.

THE great error therefore in the system of Newton, and which has been propagated by all his followers to the present day, is this, that all the heavenly bodies are supposed to be of an earthly nature, and thus there is no longer a distinction in the universe of first, middle and last, which there necessarily must be in every well-ordered series of things. This arose from his ignorance of the consummately scientific philosophy of Plato and Aristotle, and of the most sublime truths which may be discovered by exercising the reasoning power gradually, and for a long time in the orderly and irreprehensible manner which that philosophy prescribes. Hence he knew nothing of the gradation of the elements, and therefore supposed that there is the same fire, the same light, and the same earth, every where. The whole of his philosophy indeed rests on this supposition, though I trust it is sufficiently evident from what has been already delivered, that this is very far from being the case.

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[8] The authors of the Encyclopædia Britannica acknowledge, that notwithstanding all the improvements made by Mr. Dollond in telescopes, unavoidable errors perhaps still remain, as is evident from the following extract: "Hence it follows that the indistinctness arising from the spherical figure of the refracting surfaces is incomparably greater than Newton supposed; and that the valuable discovery of Mr. Dollond, of achromatic lenses, must have failed of answering his fond expectations, if his very method of producing them had not, at the same time, enabled him to remove that other indistinctness by employing contrary aberrations. And now, since the discoveries by Dr. Blair, of substances which disperse the different colours in the same proportions, but very different degrees, has enabled us to employ much larger portions of the sphere than Mr. Dollond could introduce into his object-glasses, *it becomes absolutely necessary to study this matter completely, in order to discover and ascertain the amount of the errors which perhaps unavoidably remain.*" See Articles *Telescope* and *Optics*.

In order to strengthen however what has been said on this subject, the following extract is given from Proclus (in Tim. p. 152), in which the nature of a divine body, and the various gradations of fire, and the other elements, are admirably unfolded.

"It is necessary to understand (says he) that the fire of the heavens is not the same with sublunary fire, but that this is a divine fire consubsistent with life, and an imitation of intellectual fire; while that which subsists in the sublunary region is entirely material, generated and corruptible. Pure fire therefore subsists in the heavens, and there the whole of fire is contained; but earth according to cause, subsisting there as another species of earth, naturally associating with fire, as it is proper it should, and possessing nothing but solidity alone. For as fire there is illuminative and not burning, so earth there is not gross and sluggish, but each subsists according to that which is the summit of each. And as pure and true fire is there, so true earth subsists here, and the *wholeness*, ολοτης, of earth; and fire is here according to participation and materially, as earth is according to a primary subsistence. So that in heaven the summit of earth is contained, and in earth the dregs and sediment of fire. But it is evident that the moon has something solid and dark, by her obstructing the light: for obstruction of light is alone the province of earth. The stars too obstruct our sight, by casting a shadow of themselves from on high. But since fire and earth subsist in heaven it is evident that the middle elements must be there also; air first of all, as being most diaphanous and agile, but water, as being most vaporous; each at the same time subsisting far purer than in the sublunary region, that all things may be in all, and yet in an accommodated manner in each.

"But that the whole progression and gradations of the elements may become apparent, it is necessary to deduce the speculation of them from on high. These four elements, fire, air, water and earth, subsist first of all in the fabricator of the universe, uniformly according to cause. For all causes are contained in him, according to one comprehension; as well the intellectual, divine, pure and vigorous power of fire, as the connective and vivific cause of air; and as well the prolific and regerminating essence of water, as the firm, immutable and undeviating form of earth. And this the theologist Orpheus knowing, he thus speaks concerning the demiurgus:

His body's boundless, stable, full of light.

And,

Th' extended region of surrounding air
Forms his broad shoulders, back and bosom fair.

Again,

His middle zone's the spreading sea profound.

And,

The distant realms of Tartarus obscure
Within earth's roots his sacred feet secure;
For these earth's utmost bounds to Jove belong,
And form his basis permanent and strong.

Afterwards he observes, that as the progression of things is no where without a medium, but subsists according to a well ordered subjection; and generations into these material, dissipated and dark abodes, take place through things of a proximate order,—hence the progression must be from immoveable to self-motive natures; or, in other words, from a subsistence in intellect to a subsistence in soul. These elements therefore subsist in life, and are intellectual according to participation; for such is the nature of forms in the soul. But the progression from this must be manifest. For the immediate descent from life is to animal; since this is proximate to life. And from that which is essentially self-motive, the progression is to that which is self-motive according to a participation of life. If, therefore, you take away from hence that which is immaterial and immutable, you will produce that which is material and mutable. And through this indeed, these elements are diminished from such as are prior to them; but on account of the symmetry and order of their motions, and their immutability in their mutations, they become assimilated to them. If therefore you take away this order, you will behold the great confusion and inconstancy of the elements; and

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this will be the last progression, and the very dregs and sediment of all the prior gradations of the elements."

So ignorant indeed was Newton of this gradation of the elements, and so gross in consequence of it were his conceptions of fire, that he asks in his Optics, "Is not fire a body heated so hot as to emit light copiously? For what else, adds he, is a red hot iron than fire? Upon which Bishop Berkeley in his Siris (p. 102) remarks as follows: "It should seem that to define fire by heat, would be to explain a thing by itself. A body heated so hot as to emit light is an ignited body, that is, hath fire in it, is penetrated and agitated by fire, but is not itself fire. And although it should in the vulgar sense pass for fire, yet it is not the pure elementary fire in the philosophic sense, such as was understood by the sages of antiquity, and such as is collected in the focus of a burning glass; much less is it the vis, force, or power of burning, destroying, calcining, melting, vitrifying, and raising the perceptions of light and heat. This is truly and really in the incorporeal agent, and not in the vital spirit of the universe. Motion, and even power, in an equivocal sense, may be found in this pure etherial spirit, which ignites bodies, but is not itself the ignited body, being an instrument or medium by which the real agent operates on grosser bodies."

In consequence too of this ignorance of the gradual progression of the elements, the *unweildly* earth, in the language of Bonnycastle, which we have before quoted, is in the Newtonian philosophy sent far from the centre of the system to move round the sun with the rest of the planets. If however the earth is *unweildly*, it is not easily moved, and if not easily moved, motion is not *natural* to it; for all the energies of nature are unattended with labour. Thus it is not laborious to fire to burn, nor to snow to refrigerate, nor to the vegetable life to generate, nourish and increase. And hence, if motion is natural to the earth, this motion is not laborious to it. Indeed, that the terrestrial globe is not naturally adapted to be moved, is evident from the matter of which it consists, and from its condition and composition. For it is a solid body, firm and not fluid; hard and not soft; thick, dense and compact, not thin and rare; heavy and most ponderous, and not light, and is therefore perfectly unadapted to a rectilinear motion, according to length or breath, or an upward direction, and particularly to a circular motion, and that very rapid, unless externally impelled by an almost infinite force. On the contrary, through the power of its ponderous gravity, if it were moved, as being a body in itself inert, it would again tend in a right line to the centre of the universe, and would there rest as in its proper place.

Notwithstanding this, however, the opinion that it is a planetary body, is become so general that any opposition to it is likely to be treated with ridicule. And yet some eminent men among the moderns have ventured to oppose the certainty of it. Among these is the celebrated mathematician Nieuwentiit[9], at the end of his Religious Philosopher, a work

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[9] "Great astronomers themselves (says Nieuwentiit, vol. 3, p. 1088) own themselves uncertain whether the earth moves round the sun, or the sun round the earth. Thus I remember, that having had the honour to discourse with the great Mr. Huygens about other matters, and asking him whether he could affirm any thing, with certainty, about the earth's motion; he was pleased to answer, *that it was his opinion, that as long as we were upon this earth,* nobody could be able *fully to prove the same.* Thus, likewise, we see Sir Isaac Newton, though, with Mr. Huygens, he commonly supposes the earth to move, yet he mentions the matter with great caution, and without advancing any thing positively. See Princip. Philos. p. 375, of the second edition, where it being affirmed among the hypotheses, that the centre of the world is at rest, and not moved; this reason is added, *This is allowed on all hands, whilst at the same time some make the earth, others the sun, to be at rest in the centre of the world.* We likewise find, in the fourth Phænomenon, this expression: *Of the five principal planets, and of the sun about the earth, or of the earth about the sun, the times of the revolution,* &c. And in the fourth Proposition of the said 3rd book, towards the end, we see these words: *This calculation* (which is of some moment) *is founded on the hypothesis of the immobility of the earth.*

"And can any one speak out more plainly hereupon, than the famous and so highly esteemed mathematician, P. Herigonus? who, in his Cursus Mathem. de Sphæra Mundi, p. 53, uses these positive words: *Whether the earth is in the centre of the firmament, or out of it; or whether it is moved or not moved, cannot be proved by any mathematical demonstration.*

"And that we may know that other great men do likewise speak doubtfully of the earth's motion, we need only read the last lines in p. 273, of Dr. Gregory's Astronomy; where speaking of the parallax of the fixed stars, with respect to the earth's way, he thus concludes: *For after this manner they might put the motion of the earth out of doubt, which every one would own is well worth the while.* By which he shows how uncertain the matter still is."

After adducing also the testimonies of Mr. de la Hire and Mr. Varignon, in proof of this uncertainty, work written with a very pious, and therefore with a very laudable intention; and Nicolas Moller, in his Dissertation entitled *De Indubio Solis*

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certainty, Nieuwentiit shows in Sect. 8, That it is uncertain whether the earth or the sun moves, because the parallax from the annual motion is still uncertain; Sir Isaac Newton himself acknowledging (in Princip. Philos. lib. 3, sect. 14), *That the stars have no remarkable parallax proceeding from the annual motion of the earth.*

In Sect. 9, in order to convince the reader that mathematicians themselves do not always give credit to their own hypotheses, he gives the following extract from what he calls a kind of preamble to the book of the famous Copernicus, the whole of which he says were worthy to be transcribed, had it not been too large. It is there said, that *it is not necessary that the hypotheses should be even probable, and that it is enough if the calculations may be thereby made to agree with the experiments* *. And afterwards,—*and since various hypotheses are often adapted to one motion (as in the course of the sun, an excentricity and a motion about the centre) an astronomer may choose that which is most easily comprehended. A greater probability may, perhaps, be required from a philosopher, yet neither of them can be able to discover any thing with certainty, unless God reveals it to them.* Whereupon, finally, these emphatical words follow: *Let no body, so far as it concerns an hypothesis, expect any thing certain from astronomy; since it will not afford any thing like that, lest by admitting for truth that which is dressed up for other purposes, he should leave this science with greater folly than he engaged in it.*"

Afterwards Nieuwentiit shows as follows, that mathematicians for their convenience advance hypotheses which are not only absolutely false, but are even allowed to be so by themselves. "Thus the mathematicians do suppose imaginary lines and circles for the construction of those so useful tables of sines and tangents, &c. and in those of logarithms, that all numbers are the true ones; whereas among hundreds of them, there be very few that are really so. For which reason also, and that the difference between true and false may be the less, their way is to use such great numbers.

"So, likewise, surveyors, or those that measure land, though they find some lines to be a little crooked, and sometimes go in and out in small angles, yet they take them for straight ones; provided only that from the supposition of such a known falsity a greater convenience results, and the difference be not very considerable.

"Who does not know, that making the degrees of latitude larger and larger in navigation, is nothing but a mere fiction, and only that one may with more conveniency make good the real decrease of each degree of longitude, though such useful and necessary tables are calculated upon the same foundation?

"Though it be known to such as understand optics, that spherical glasses never collect the rays into a point, (excepting in one or two cases) as glasses of some figures do; yet how common a thing is it in the making of telescopes or microscopes, to suppose the same, contrary to

* Astronomically speaking, this may be admitted, but not physically or philosophically.

truth;

Solis Motu, Immotaque Telluris Quiete, 1734, 4to; to the latter of which treatises in particular I refer the reader who wishes for further proofs of the

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truth; and the demonstration of the practical part is founded thereupon, even by such as know that this is a manifest falsity in the theory.

"What is more common than to suppose in statics, that two plumets fall down in strait lines parallel to each other, whereas they would notwithstanding both meet at the centre of the earth?

"In like manner, and upon the same foundations, it is supposed by gunners, and even by those famous mathematicians that write upon the art of throwing bombs, that their balls by the force of the powder, and their own gravity, do describe a line which they call a parabola; whereas if they considered the resistance of the air, and other causes aforementioned, they would know that the properties thereof were very different.

"In dialling, we suppose the centre of the earth, or rather of the sun's course, to be always at the top of the perpendicular style (when the shadows of it, as a nodus, show the hours) wheresoever the dial be placed upon the whole earth, though every body knows it to be contrary to the truth.

"Thus all the ancient and modern astronomers have always taken it for a foundation of their calculations, that the true or apparent daily motion of the sun is in a circle parallel or equally distant from the equinoctial, notwithstanding that this line, by the intermixing of the sun's or earth's annual course, comes nearer to a screw or spiral line, than a circle, as is well known to the astronomers."

And lastly, in sect. 11, he shows that the simplicity of an hypothesis is not always an argument of its truth. "For, says he, let such as maintain that it is, tell us what is the reason why all astronomers, at least all that I know, and among whom there are likewise many that zealously contend for the earth's moving, and the sun's standing still, as Copernicus himself, and since him Kepler, Lantsberg, and in our time the North-Hollander, Richard Rembramsen van Nierop; though all of them do in the theory, or annual course from east to west, maintain the hypothesis of a moving earth (forasmuch as the calculations are much more convenient according to them in this case), yet in every thing that belongs to the Spherics, or daily revolution from east to west, they are wont to make their figures and calculations directly contrary to their own notions, upon the foot of a moving sun and a resting earth, though they commonly start the greatest objections against this last.

"Of what has been said, there is no farther proof necessary, since this is apparent to every body in almost all figures that are used by them to this purpose; in which they are even wont to express the parallels, in which the sun daily moves, and to call them by that name. It seems to me likewise to be particularly remarkable, that Mr. Whiston himself, who is otherwise so great a champion for a moving earth, does transcribe the demonstration of the manner after which Mr. Casini has so ingeniously observed the parallax of the planets, into his Prælect. Astron. p. 75, &c. with so great respect from the Act. Lips. 1685, almost in the words of Mr. Blanchini; notwithstanding that the same is formed upon the hypothesis of a fixed earth, and the daily revolution of the immobility of the earth. I shall only add on this subject, that Corsinus, Professor of philosophy in Academia Pisana, though he was an advocate on the whole for the Newtonian system, yet in his Institutiones Philosophicæ, Tom. 3. p. 114, he observes, "That there are some things in the Copernican hypothesis, which may appear to be difficult and absurd, or certainly more freely devised, such as so immense and enormous a distance of the fixed stars, that the annual orbit of the earth, whose diameter exceeds a hundred millions of miles, is to be considered but as a point, when compared to the starry heaven; that perennial motion of the air which both in its upper and lower part must accurately follow the motion of the earth; the stroke of heavy falling bodies, and other things of this kind, which even to the wisest defenders of the Copernican hypothesis, are wont to appear most weighty [2]." And afterwards he candidly asks, "Since we are scarcely able to define any thing with certainty concerning the virtue of the magnet, the origin of the ebbing and flowing of the sea, the shells dug out of the summits of mountains, and innumerable other things which are beheld in the earth, the passive qualities and effects of which are obvious, but we enquire about all these by conjecturing and divining, ought any certain thesis to be vehemently defended respecting celestial concerns, which are situated far from our knowledge, which we can scarcely obtain by any testimony of the senses, and which lastly we cannot accurately define [3]?" It

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the fixed stars and planets, showing what he himself terms it, *The daily revolution of Mars in a circle*, and often using this expression, *That Mars and the fixed stars are moved and carried round about by the diurnal motion.*"

[2] "Nonnulla tamen sunt, quæ in hac hypothesi difficilia, absurda, vel certè liberiùs efficta videri poterunt, ut immensa, et enormis adeò siderum distantia, ut orbis annuus, cujus diameter 100 milliones milliarium excedat, cœlo sidereo comparatus, veluti punctum haberi possit; perennis ille motus aeris, qui tum in superiori, tum in inferiori sui parte motum telluris accuratè sequatur; gravium decidentium ictus, aliaque id genus, quæ sapientissimis etiam viris Copernicam hypotheism propugnantibus gravissima videri solent." This work was published at Venice, 1743, in 12mo.

[3] "Fierine denique oportuit, ut cum de magnetis virtute, de æstu maris origine, de conchiliis in montium verticibus effossis, aliisque innumeris rebus quæ in terra conspiciuntur, quarum affectiones,

It is true indeed, that as we cannot closely inspect the heavenly as we can earthly bodies, we cannot speak with the same certainty of their peculiarities, as of what belongs to them in general. We may however confidently assert from the very scientific physiology delivered by Plato and Aristotle, that they are bodies essentially different from such as are earthly, and that motion is natural to them, and immobility to the earth.

Another great error likewise in the system of Newton, is the admission of the possibility of infinite worlds; and this hypothesis arose from an ignorance of the order of things; and of the nature of the fabricator of the universe. For if there are infinite worlds or systems, they will be uncoordinated with relation to each other. For what order can there be in the actual infinite of things first and second, where there is no first; since in an actually infinite number there can be neither first nor last. For the infinite has a threefold subsistence; since it is either in power, or in magnitude, or in number. The infinite in power is that which subsists in divinity. In magnitude the actual infinite has no subsistence whatever: and in number it has partly a subsistence, and partly not. For it does not subsist collectively, or at once, but according to a part, or, in other words, according to the power of receiving an additional number beyond any assignable number. In the next place, these infinite worlds will have no producing cause; for if they had, this producing cause prior to multitude would produce a comprehending one, and prior to parts a whole. For this cause being itself one, will first assimilate its progeny to itself; since every naturally producing cause wishes to render its productions similar to itself. But where there is a first in productions there is no infinite. If also other worlds are supposed to subsist from others, the causes of them will either be unco-ordinated, or co-ordinate. And if they are co-ordinate, it is necessary that the worlds should have one co-ordination. But in the infinite there is no order.

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tiones, et affectus omnes oculis ipsis observantur, nihil ferè certò definire possimus, sed omnia conjiciendo, ac divinando inquiramus, de rebus tamen cælestibus, quæ procul a nostra cognitione positæ sunt, quas nullo ferè sensuum testimonio consequimur, quas nulla denique certa ratione complecti possumus, certa quædam thesis acerimè defendatur?"

To which may be added, that a vacuum intervening in the middle, will separate the worlds from each other. But if the causes are un-coordinated, there will be in the principles a multitude divided and void of sympathy. And if this be the case, both the causes and their progeny will be entirely destroyed. For the former will be corruptive of each other, in consequence of possessing that which is entirely foreign and uncongenial, and thus not being able to subsist together. But the worlds, the progeny of these causes, will be involved in ruin, and utterly perish. For their principles being destroyed, there will not be any thing from which they can again be generated.

CHAPTER XII.

I SHALL close my discussion of the philosophy of Newton with showing the imperfection of his account of the Deity, at the end of his Principia, and in his Optical Queries; and I shall present the reader with what he says on this subject, in the former of these works, as it is given by Mr. Bonnycastle, in p. 414 of his Introduction to Astronomy. Afterwards, I shall compare it with what Plato and the best of the Platonists have asserted of the first cause of all; in order that the reader may see how greatly the conceptions which these men formed of the ineffable principle of things, surpass those of Newton.

"This Being then, says Newton, governs all things, not as the soul of the world, but as lord over all; and on account of his dominion, he is wont to be called Lord God, or universal ruler. For *God is a relative word, and has respect to servants;* and deity is the dominion of God, not over his own body, as those imagine who fancy him to be the soul of the world, but over servants. The supreme God is a being eternal, infinite, and absolutely perfect; but a being however perfect, without dominion, cannot be said to be Lord God: for we say, my God, your God, the God of Israel, the God of Gods; my Eternal, your Eternal, the Eternal of Israel, the Eternal of Gods; but we do not say, my infinite, or, my perfect; these are titles which have no respect to servants. The word God usually signifies Lord; but every lord is not a god. It is the dominion of a spiritual being which constitutes a God; a true supreme or imaginary dominion, makes a true, supreme or imaginary god. And from his true dominion it follows, that the true God is a living, intelligent and powerful being; and from his other perfections, that he is supreme or most perfect. He is eternal and infinite, omnipotent and omniscient; that is, his duration reaches from eternity to eternity, his presence from infinity to infinity; he governs all things, and knows all things that are or can be done. *He is not eternity or infinity, but eternal and infinite;* he is not duration or space, but he endures and is present. He endures for ever, and is every where present; and by existing always and every where, constitutes duration and space. Since every particle of space is always, and every indivisible moment of duration is every where, certainly *the maker and lord of all things cannot be never and no where.* Every soul that has perception is, though in different times, and in different organs of sense and motion, still the same indivisible person. There are given successive parts in duration, and co-existent parts in space, but neither the one nor theother in the person of a man, or his thinking principle; and much less can they be found in the thinking substance of God. Every man, so far as he is a thing that has perception, is one and the same man during his whole life, in all and each of his organs of sense. God is one and the same God, always and every where. He is omnipresent, not virtually only, but also substantially; for *virtue cannot subsist without substance.** In him are all things contained and moved; yet neither affects the other: God suffers nothing from the motion of bodies; bodies find no resistance from the omnipresence of God. It is allowed by all, that the supreme God exists necessarily, and by the same necessity he exists always and every where. Hence also he is all similar, all eye, all ear, all brain, all arm, all power to perceive, to understand, and to act; but in a manner not at all human, in a manner not at all corporeal, in a manner utterly unknown to us. As a blind man has no idea of colours, so have we no idea of the manner by which the all-wise God perceives and understands all things. *He is utterly void of all body and bodily figure, and can therefore neither be seen nor heard, nor touched;* nor ought he to be worshipped under the representation of any corporeal thing. We have ideas of his attributes, but what the real substance of any thing is, we know not. In bodies we see only their figures and colours, we hear only the sounds, we touch only their outward surfaces, we smell only the odours, and taste the savours, but their inward substances are not to be known, either by our senses, or by any reflex act of our minds; much less, then, have we any idea of the substance of God. We know him only by his properties and attributes, by his most wise and excellent contrivance of things, and by final causes; we admire him for his perfections, but we reverence and adore him on account of his dominion; for we adore him as his servants; and a God without dominion, providence and final causes, is nothing but Fate and Nature. Blind metaphysical necessity, which is certainly the same always and every where, could produce no variety or change. All that diversity of natural things which we find, suited to different times and places, could arise from nothing but the ideas and will of a being necessarily existing. But by way of allegory, God is said to see, to love, to rejoyce, to fight, &c. *for all our notions of God are taken from the ways of mankind,* by a certain similitude, which though not perfect, has some likeness however."

This account of the deity is far from representing him in that point of view which is either most amiable or most characteristic of his nature. For it principally describes him as an absolute master, to whom all things have the relation of servants; but no notice whatever is taken of his great characteristic *goodness itself,* through which he is the object of desire to all things. When also he says, that "*God is not eternity nor infinity, but eternal and infinite,*" instead of making him, as Plato does, to be something more venerable than he makes him to be posterior to, eternity and infinity. For that which is eternal, and that which is infinite, are so by the participation of eternity itself, and infinity itself, and participants (in incorporeal natures) are subordinate to the things they participate. In the next place, he describes the deity as a being that is *every where*, but omits to add that he is at the same time *no where*; though a subsistence *no where* primarily and simply belongs to the principle of all things. For he is not in things posterior to himself, because he is without habitude, proximity, or alliance to any thing; nor can he be in any thing prior to himself, because he is the first. Hence, in the Parmenides of Plato, it is asserted of *the one*, that it is *no where*. And when he says, " *that all our notions of God are taken from the ways of mankind*," he seems in the first place to be ignorant that all men have an innate knowledge of divinity, which, as Iamblichus beautifully observes, is co-existent with our essence, is superior to all judgment and deliberate choice, and is prior both to reason and demonstration[*]. And, in the next place, he had no conception of that scientific ascent to the cause of all, founded on this innate knowledge, which is unfolded in the 2d book of this Dissertation, and which has nothing to do with the ways of mankind. When also he adds, " *that the deity is utterly void of all body and bodily figure, and can therefore neither be seen nor heard, nor touched*," he discovers an extreme poverty of theological knowledge, since all that is here said is equally as applicable to the rational part of the human soul as to the deity, who infinitely transcends our nature, and not only our nature, but that of many orders of beings, incomparably more excellent than man.

Newton, also, in the queries at the end of his Optics, represents the deity as locally present with things; for he says, " Is not the sensory of animals that place to which the sensitive substance is present; and into which the sensible species of things are carried through the nerves and brain, that there they may be perceived by their immediate presence to that substance? And these things being rightly dispatched, does it not appear from phænomena, that there is a being incorporeal, living, intelligent, omnipresent, who in infinite space, as it were, in his sensory, sees the things themselves intimately, and thoroughly perceives them, and comprehends them wholly by their immediate presence to himself: of which things the images only carried through the organs of sense into our little sensoriums, are there seen and beheld by that which in us perceives and thinks?"

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[*] συνυπαρχει γαρ ημων αυτῃ τῃ ουσιᾳ η περι θεων εμφυτος γνωσις, κρισεως τε πασης εστι κρειττων και προαιρεσεως, λογου τε και αποδειξεως προυπαρχει. Iamblich. De Mysteriis, p. 4.

Infinite space, according to this conception, being the sensorium of deity, will be the instrument of his knowledge; so that without this space he will not be able to know all things. And Addison, in No. 565 of the Spectator, even applauds Newton, for thus making infinite space to be the organ of divine knowledge. For he says, "The noblest and most exalted way of considering infinite space, is that of Sir Isaac Newton, who calls it the sensorium of the godhead. Brutes and men have their sensoriola, or little sensoriums, by which they apprehend the presence and perceive the actions of a few objects that lie contiguous to them. Their knowledge and observation turn within a very narrow circle. But as God Almighty cannot but perceive and know every thing in which he resides, infinite space gives room to infinite knowledge, and is as it were an organ to omniscience."

This Newtonian conception of the deity, therefore, as residing in, and being indigent of infinite space, to his knowledge of all things, gives us no higher idea of him, than that of an infinitely great spider endued with intellect, and situated in an immense cobweb; which becomes as it were its sensorium, and the organ of its knowledge, through the notices which it communicates to the spider by the motions of its threads[5]. Besides, to make infinite space the sensorium

of

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[5] If Newton had been properly disciplined in the philosophy of Plato and Aristotle, he would not have formed such a gross and unscientific conception of the deity, as the above extract from his Optics evinces he did, but he would have assented to the doctrine contained in the following extracts, from the *αφορμαι προς τα νοητα*, of Porphyry, or *Auxiliaries to the knowledge of Intelligibles*.

"Every body is in place; but nothing essentially incorporeal, or any thing of this kind, subsists in place.

"Things

of the Deity, is to make him indigent of that which he himself produced. For Newton in his account of the deity given at the end of his Principia, and which we have before quoted, says, "*that God by existing always and every where constitutes duration and space.*"

Dr. Horseley, in a note on this passage of Newton, quotes the following

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"Things essentially incorporeal, because they are more excellent than all body and place, are every where, not with interval, but impartibly (or without parts).

"Things essentially incorporeal are not locally present with bodies, but they are present with them whenever they are willing; and this by verging to them, so far as they are naturally adapted to verge. Hence, not being locally present with them, they are present by habitude, (i. e. by proximity or alliance).

"The subsistence of body does not in any respect prevent that which is essentially incorporeal from being present where it wishes to be, and as it will. For as that which is void of bulk is incomprehensible by body, and has no relation whatever to it, so that which subsists with bulk cannot oppose that which is incorporeal, but lies like non-entity before it. Nor does an incorporeal nature pervade locally where it pleases; for place is consubsistent with bulk. Nor is it contracted by the presence of bodies. For whatever subsists in that which has bulk is able to be contracted by it, and to make a transition locally. But that which is entirely without bulk and magnitude cannot be detained by bulk, and does not partake of local motion. Hence, by a certain disposition, it is found to be there where it is inclined to be, at the same time being every where and no where in place. *By a certain disposition,* therefore, it is either above the heavens, or is contained in some part of the universe. However, when it is contained in a certain part of the world, it is not visible to the eyes, but its presence becomes apparent from its works.

"God, intellect, and soul, are every where, because they are no where. But God is every where and no where, in all the things posterior to him, and alone is as he is, and as he wills. Intellect is in God indeed, but is every where and no where in things posterior to itself. And soul is in intellect and in God, but is every where and no where in body: but body is in soul, in intellect, and in God. And, though all beings and non-beings proceed from, and subsist in God, yet he is neither beings, nor does he subsist in them. For, if he was alone every where, he would be all things, and in all; but since he is also no where, all things are generated through him. And they are contained in him, because he is every where; but are different from him because he is no where. In like manner intellect, being every where and no where, is the cause of souls and of things posterior to souls; and it is neither soul, nor the natures posterior to soul, nor does it subsist in these; because it is not only every where in things posterior to itself, but also no where. And soul is neither body, nor in body, but is the cause of body; because, being every where with respect to body, it is no where. And this progression of things extends as far as to that which is neither able to be at the same time every where, nor yet no where, but partially participates of each."

ing Orphic lines, as if they perfectly coincided with the conception of Newton:

Νους δε οι αψευδης, βασιληιος, αφθιτος, αιθηρ,
Ωι δη παντα κλυει, και φραζεται, ουδε τις εστιν
Αυδη ουδ' ενοπη, ουδ' αυ κτυπος, ουδε μεν οσσα
Η' ληθει διος ουας υπερμενεος κρονιωνος.

Procl. in Tim. Lib. 3, p. 164.

But when in these lines ether is said to be the royal, incorruptible and veracious intellect of the fabricator of the universe, and to perform the office of an ear to him, the assertion is merely symbolical of his containing in himself the fountain or divine cause of sensation. For in the Orphic theology, Jupiter is symbolically celebrated as the whole universe, in consequence of containing the causes of all things in himself[6].

Compare then this very imperfect, and in some instances false, account of the deity, with that which is given by Plato, and the best of his disciples, and to which, as we have before shown, Aristotle entirely assents. For the cause of all is celebrated by Plato under the appellations of *the one* and *the good*, by the former of these names indicating his transcendent simplicity, and his subsistence as the principle of all things, and by the latter proclaiming him to be the universal object of desire; for all beings desire good. Both in the Parmenides too and Republic, he is celebrated by Plato as superessential, and in consequence of this, as something perfectly ineffable. Hence, at the conclusion of the first hypothesis in the Parmenides, he says, "Neither does any name belong to *the one*, nor discourse, nor any science, nor sense, nor opinion. And hence it can neither be named, nor spoken of, nor conceived by opinion, nor be known, nor perceived by any being." In the Republic too, he profoundly compares this ineffable principle to the sun, as being an incomprehensible and inaccessible light, upon which the more attentively the eye of the soul looks, the more it will be dazzled and blinded, and become at length stupified, as it were, with excess of light. According to Plato too, *the one* is *every where*, and at the same time *no where;* every where, as illuminating all things with divine light, and *no where*, as being perfectly exempt from the natures he illuminates.

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[6] See the extract from Proclus in p. 517.

Hence, Damascius[7] beautifully observes concerning the first cause, or *the one*, as follows: "Our greatest conceptions, when exercised with each other, verge to a uniform and simple summit as their end, like the extremities of lines in a circle hastening to the centre. And though even thus they subsist indeed with distribution, yet a certain vestige of the knowledge of the form which we contain is pre-excited; just as the equal tendency of all the lines in a circle to terminate in the middle, affords a certain obscure representation of the centre.—We must, therefore, expand ourselves to *the one*, first collecting, and afterwards dismissing what we have collected, for the super-expanded transcendency of *the one*. Ascending, therefore, shall we meet with it as that which is known? Or wishing to meet with it as such, shall we arrive at the unknown? Or may we not say that each of these is true? For we meet with it afar off as that which is known; and when we are united to it from afar, passing beyond that in our nature which is gnostic of *the one*, then are we brought to be one, that is, to be unknown instead of being gnostic. This contact, therefore, as of one with one, is above knowledge, but the other is as of that which is gnostic with that which is known. As, however, the crooked is known by the straight, so we form a conjecture of the unknown by the known. And this, indeed, is a mode of knowledge. *The one*, therefore, is so far known, that it does not admit of an approximating knowledge, but appears afar off as known, and imparts a gnostic indication of itself. Unlike other things, however, the nearer we approach to it, it is not the more, but on the contrary, less known; knowledge being dissolved by *the one* into ignorance, since, as we have before observed, where there is knowledge, there is also separation; But separation approaching to *the one* is inclosed in union; so that knowledge also is refunded into ignorance. Thus, too, the analogy of Plato requires. For first we endeavour to see the sun, and we do indeed see it afar off; but by how much the nearer we approach to it, by so much the less do we see it; and at length we neither see other things, nor it, the eye becoming spontaneously dazzled by its light."

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[7] In his manuscript treatise, *περι αρχων*, *On Principles*. See the whole extract from which this is taken, at the end of the 9th vol. of my translation of Aristotle.

This doctrine, concerning the ineffable principle of things, which is unequalled for its sublimity and profundity, inspired that divine magnificence of conception which is so conspicuous in the following passage from Proclus, in his second book On the Theology of Plato. "Let us now, if ever, remove from ourselves multiform knowledge, exterminate all the variety of life, and in perfect quiet approach near to the cause of all things. For this purpose, let not only opinion and phantasy be at rest, nor the passions alone which impede our anagogic impulse to *the first*, be at peace; but let the air be still, and the universe itself be still. And let all things extend us with a tranquil power to communion with the ineffable. Let us also, standing there, having transcended the intelligible (if we contain any thing of this kind), and with nearly closed eyes adoring as it were the rising sun, since it is not lawful for any being whatever intently to behold him—let us survey the sun whence the light of the intelligible gods proceeds, emerging, as the poets say, from the bosom of the ocean; and again, from this divine tranquillity descending into intellect, and from intellect, employing the reasonings of the soul, let us relate to ourselves what the natures are from which, in this progression, we shall consider the first god as exempt. And let us as it were celebrate him, not as establishing the earth and the heavens, nor as giving subsistence to souls, and the generations of all animals; for he produced these indeed, but among the last of things; but, prior to these, let us celebrate him as unfolding into light the whole intelligible and intellectual genus of gods, together with all the supermundane and mundane divinities—as the god of all gods, the unity of all unities, and beyond the first adyta,—as more ineffable than all silence, and more unknown than all essence,—as holy among the holies, and concealed in the intelligible gods[8]."

Compare, too, the manner in which Newton represents divinity as omniscient, with the very sublime way in which he is said by Proclus to know all things, in the following extract from his MS. Commentary on the Parmenides of Plato: "Every thing which energizes, energizes according to its own nature and order, some things divinely and supernaturally, others naturally, and others in a different manner; and if this be the case, it is evident that every gnostic being knows according to its own nature, and that it does not follow, that because the thing known is one and the same, on this account the natures which know, energize in conformity to the essence of the things known. Thus, sense, opinion, and our intellect, know that which is white, but not in the same manner: for sense cannot know what the essence is of a thing white, nor can opinion obtain a knowledge of its proper objects in the same manner as intellect; since opinion only knows *that* a thing is, but intellect knows the cause of its existence. *Knowledge, therefore, subsists according to the nature of that which knows, and not according to the nature of that which is known.* What wonder is it then, that divinity should know all things in such a manner as is accommodated to his nature, viz. divisible things, indivisibly; things multiplied, uniformly;

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[8] Αγε δη ουν, ειπερ ποτε, και νυν τας πολυειδεις αποσκευασωμεθα γνωσεις, και παν το ποικιλον της ζωης εξορισωμεν αφ' ἡμων, και παντων εν ηρεμιᾳ γενομενοι, τῳ παντων αιτιῳ προσιωμεν εγγυς. εστω δε ἡμιν μη μονον δοξης, μηδε φαντασιας ηρεμια, μηδε ἡσυχια των παθων ἡμων εμποδιζοντων την προς το πρωτον αναγωγον ορμην, αλλ' ἡσυχος μεν αηρ, ἡσυχον δε το παν τουτο. παντα δε ατρεμει τῃ δυναμει προς την του αρρητου μετουσιαν ἡμας ανατεινετω. και σταντες εκει, και το νοητον (ει δη τι τοιουτον εστιν εν ἡμιν) ὑπερδραμοντες, και ὁιον ἡλιον ανισχοντα προσκυνησαντες, μεμυκοσι τοις οφθαλμοις (ου γαρ θεμις αντωπειν ουδε αλλο των οντων ουδεν) τον τοινυν του φωτος των νοητων θεων ἡλιον εξ ωκεανου, φασιν ὁι ποιηται, προφαινομενον ιδοντες, και αυθις εκ της ενθεου ταυτης γαληνης εις νουν καταβαντες, και απο νου τοις της ψυχης χρωμενοι λογισμοις, ειπωμεν προς ἡμας αυτους, ὡν εξηρημενον εν τῃ πορειᾳ ταυτῃ τον πρωτον θεον τεθειμεθα. και ὁιον ὑμνησωμεν αυτον ουχ ὁτι γην και ουρανον ὑπεστησεν λεγοντες, ουδ' αυ ὁτι ψυχας, και ζωων απαντων γενεσεις, και ταυτα μεν γαρ, αλλ' επ' εσχατοις. προ δε τουτων, ὡς παν μεν το νοητον των θεων γενος, παν δε το νοερον εξεφηνε, παντας δε τους ὑπερ τον κοσμον, και τους εν τῳ κοσμῳ θεους απαντας, και ὡς θεος εστι θεων απαντων, και ὡς ἑνας ἑναδων, και ὡς των αδυνατων (lege αδυτων) επεκεινα των πρωτων, και ὡς πασης σιγης αρρητοτερον, και ὡς πασης ὑπαρξεως αγνωστοτερον, ἁγιος εν ἁγιοις, τοις νοητοις εναποκεκρυμμενος θεοις. Procl. in Plat. Theol. p. 109.

things generated, according to an eternal intelligence; totally, such things as are partial; and that with a knowledge of this kind he should possess a power productive of all things, or, in other words, that by knowing all things with simple and united intellections, he should impart to every thing being, and a progression into being. For the auditory sense knows audibles in a manner different from the common sense; and prior to, and different from these, reason knows audibles, together with other particulars which sense is not able to apprehend. And again, of desire which tends to one thing, of anger which aspires after another thing, and of *proairesis*, or deliberate choice, there is one particular life moving the soul towards all these, which are mutually motive of each other. It is through this life that we say, I desire, I am angry, and I deliberately choose this thing or that; for this life verges to all these powers, and lives in conjunction with them, as being a power which is impelled to every object of desire. But prior both to reason and this one life, is *the one* of the soul, which often says, I perceive, I desire, and I deliberate, which follows all these energies and energizes together with them. For we should not be able to know all these, and to apprehend in what they differ from each other, unless we contained a certain indivisible nature, which has a subsistence above the common sense, and which prior to opinion, desire and will, knows all that these know and desire, according to an indivisible mode of apprehension.

If this be the case, it is by no means proper to disbelieve in the indivisible knowledge of divinity, which knows sensibles without possessing sense, and divisible natures without possessing a divisible energy, and *which, without being present to things in place, knows them prior to all local presence*, and imparts to every thing that which every thing is capable of receiving. The unstable essence, therefore, of apparent natures is not known by him in an unstable, but in a definite manner; nor does he know that which is subject to all various mutations dubiously, but in a manner perpetually the same; for by knowing himself, he knows every thing of which he is the cause, possessing a knowledge transcendently more accurate than that which is co-ordinate to the objects of knowledge. Divinity, therefore, knows without busily attending to the objects of his intellection, because he abides in himself, and by alone knowing himself, knows all things. Nor is he indigent of sense, or opinion, or science, in order to know sensible natures; for it is himself that produces all these, and that in the unfathomable depths of the intellection of himself, comprehends an united knowledge of them, according to cause, and in one simplicity of perception. Just as if some one, having built a ship, should place in it men of his own formation, and in consequence of possessing a various art, should add a sea to the ship, produce certain winds, and afterwards launch the ship into the new created main. Let us suppose, too, that he causes these to have an existence by merely conceiving them to exist, so that by imagining all this to take place, he gives an external subsistence to his inward phantasms, it is evident that, in this case, he will contain the cause of every thing which happens to the ship through the winds on the sea, and that by contemplating his own conceptions, without being indigent of outward conversion, he will at the same time both fabricate and know these external particulars. Thus, and in a far greater degree, that divine intellect, the artificer of the universe, possessing the causes of things, both gives subsistence to, and contemplates, whatever the universe contains, without departing from the speculation of himself. But if with respect to intellect, one kind is more partial, and another more total, it is evident that there is not the same intellectual perfection of all things, but that where intelligibles have a total and undistributed subsistence, there the knowledge is more total and indivisible, and where the number of forms proceeds into multitude and extension, there the knowledge is both one and multiform. Hence, this being admitted, we cannot wonder on hearing the Orphic verses, in which the theologist says,

Αυτη δε Ζηνος και εν ομμασι πατρος ανακτος
Ναιουσ' αθανατοι τε θεοι, θνητοι τ' ανθρωποι,
Οσσα τε ην γεγαωσα, και υστερον οσσα εμελλον.

i. e.

There in the sight of Jove, the parent king,
Th' immortal gods and mortal men reside,
With all that ever was, and shall hereafter be.

For the artificer of the universe is full of intelligibles, and possesses the causes of all things separated from each other."

The admirable dogma in this most beautiful extract, "that knowledge subsists according to the nature of that which knows, and not according to the nature of that which is known," was originally derived from Iamblichus, as is evident from the commentary of Ammonius on Aristotle's treatise on Interpretation, (see note to p. 162, of my translation of the Organon.) Boethius, in the fifth book of his treatise De Consolatione, elegantly illustrates this dogma. The passage I allude to begins with the words, "Omne enim quod cognocitur, non secundum sui vim, sed secundum cognoscentium potius comprehenditur facultatem." The sources, however, from whence Boethius derived this doctrine, appear to have been unknown to all his editors and commentators; for they are not noticed by any of them.

From all, therefore, that I have said about the philosophy of Newton, it appears that he committed the same mistake as to the writings of Plato and Aristotle, that he did with respect to the Elements of Euclid. For we are informed by Dr. Hutton, in his Mathematical Dictionary[9], "That Newton spoke with regret of his mistake at the beginning of his mathematical studies, in applying himself to the works of Des Cartes, and other algebraic writers, before he had considered the Elements of Euclid with that attention which so excellent a writer deserves." And that what Dr. Hutton here relates is true, is evident from the following extract from the Universal Arithmetic of Newton[1]: "Equations are expressions of arithmetical computation, and properly have no place in geometry, except as far as quantities truly geometrical, (that is, lines, surfaces, solids, and proportions,) may be said to be some equal to others. Multiplications, divisions, and such sort of computations, are newly received into geometry, and that unwarily, and contrary to the first design of this science. For whoever considers the construction of problems by a right line and a circle, found out by the first geometricians, will easily perceive that geometry was invented that we might expeditiously avoid, by drawing lines, the tediousness of computation. *Therefore these two sciences ought not to be confounded. The ancients did so industriously distinguish them from one another, that they never introduced arithmetical terms into geometry. And the moderns, by confounding both, have lost the simplicity in which all the elegancy of geometry consists.*" It seems, however, that having committed this mistake, he thought he must make the best of it. For shortly after he adds, "Wherefore I ought not to be blamed, if, with that prince of mathematicians, Archimedes, and other ancients, I make use of the conchoid for the construction of solid problems. *But if any one thinks otherwise, let him know that I am here solicitous not for a geometrical construction, but any one whatever, by which I may the nearest way find the roots of the equations in numbers.*" Surely in this last sentence, after what he had above acknowledged, to adopt a nautical phrase, he was trimming his sails to the wind. On the whole, therefore, I conclude, from the great mathematical genius which Newton possessed, that if he had been fortunately led to know as much of the works of Plato and Aristotle, after having been disciplined in those of Bacon and other moderns, as he did of Euclid, after applying himself to the works of Des Cartes, and other algebraic writers, he would have much more regretted his mistake in his philosophical, than he did in his mathematical studies.

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[9] See the article Newton in that Dictionary.

[1] I here quote the translation of the Universal Arithmetic by Ralphson, 1728, 8vo. p. 227, not having the original at hand.

CHAPTER XII.

Of the systems of the three celebrated moderns, who introduced philosophies of their own invention, without understanding the philosophy of Plato and Aristotle, it now remains for me to consider that of Locke. And in doing this, I shall confine myself to an examination of the fundamental principles of his theory of the human mind. These then are as follow: That there are no innate principles of knowledge,

ledge, and particularly no innate speculative principles[2]. That the mind is like white paper, void of all characters, without any ideas, and that the materials of its reason and knowledge are derived from experience, in which all our knowledge is founded, and ultimately obtained. That our senses being first conversant about particular sensible objects, convey into the mind several distinct perceptions of things; and that the other fountain, from which experience furnishes the understanding with ideas, is the perception of the operations of our own mind within us, as it is employed about the ideas it has acquired[3]. That as words stand as outward marks of our inward ideas, and those ideas being taken from particular things, if every particular idea that we take in should have a distinct name, names must be endless. That to prevent this, the mind causes the particular ideas received from particular objects to become general; which is done by considering them as they are in the mind, viz. appearances separate from all other existences, and the circumstances of real existence, as time, place, or any other concomitant ideas. This, he adds, is called abstraction, whereby ideas taken from particular beings, become general representatives of all of the same kind, and their names general names, applicable to whatever exists conformable to such abstract ideas. That such precise naked appearances in the mind, the understanding lays up as the standard to rank real existences into sorts, as they agree with these patterns, and to denominate them accordingly. Thus the same colour being observed to day in chalk or snow, which the mind yesterday received from milk, it considers that appearance alone; makes it a representative of all that kind; and having given it the name whiteness, it by that sound signifies the same quality, wheresoever to be imagined or met with: and thus universals, whether ideas or terms, are made[4].

With respect, then, to the dogma, that there are no innate ideas, and that the mind is like white paper, void of all characters, deriving the materials of its knowledge from experience, I deem it will be a sufficient confutation of this doctrine to observe, that unless the soul *essentially* and eternally contained all knowledge in herself, she never would be led to the investigation of truth. The knowledge of the soul, indeed, from her connexion with the body, is in a dormant state, till it is evocated by discipline and enquiry. But unless she contained knowledge in herself latently, the objects of her investigation would be things with which she had never before been acquainted, and in this case, how could she be certain that she ever detected them? Indeed it would be as impossible on this hypothesis for the soul to know any thing about them, even when she perceived them, as it would be to tell the meaning of the words of an unknown language on hearing them pronounced. To say, therefore, that intellect is like white paper, void of all characters, and is the passive recipient of all forms, is very far from removing the doubt, why the soul is led to investigate truth. For how does this intellect understand? Since it must either understand the things which it already knows, or things which it does not know. If the former, investigation is unnecessary, and to say that it understands what it does not know, is absurd. Besides, our looking into ourselves, when we are endeavouring to discover any truth, evinces that we inwardly contain truth, though concealed in the darkness of oblivion. The delight, too, which attends our discovery of the truth, sufficiently proves that this discovery is nothing more than a recognition of something most eminently allied to our nature, and which had been, as it were, lost in the middle space of time, between our former knowledge of the truth, and the recovery of that knowledge. For the perception of a thing perfectly unknown and unconnected with our nature, would produce terror instead of delight; and things are pleasing only in proportion as they possess something known, and domestic to the nature by which they are known. What experience, therefore, could ever convince the soul that she had at length found the truth she was in search of? For if it is a novel truth, and if it is not novel, why does she explore it, how is she to know it when she finds it? Hence if she knows it, her knowledge must be recognition. Indeed, her search otherwise would be just as absurd as if a master should pursue a fugitive servant, whom he had never seen, and expect that he should know him when he saw him.

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[2] See chap. 2, book 1, of the Essay on Human Understanding.

[3] See chap. 1, book 2.

[4] See chap. 11, book 2.

The next most important principle of his theory is, the generalization of the particular ideas received from sensible objects, and which is called abstraction; the soul, according to him, having no conception of any other universals, than those ideas which are taken by the mind from objects of sense, and which thus become general representatives of all of the same kind. This theory is not the invention of Locke, though it is supposed to be so by most of the moderns; for it is ancient, and is opposed with an invincible strength of argument, combined with consummate eloquence by the philosopher Proclus. I shall, therefore, present the reader with a translation of what he says in opposition to this doctrine, as I should think it great arrogance and folly in me, were I to give my own conceptions on this subject instead of his; being so firmly convinced as I am, that he was a man in no respect inferiour to any one of the greatest masters of wisdom that ever lived. This very extraordinary man, therefore, to whom, if I should attempt to give due thanks for the great benefits I have received from his invaluable works, the whole of time would not be sufficient, admirably opposes this theory of Locke as follows, in his Commentary on the first book of Euclid's Elements, p. 3. And though his arguments are intended to show the absurdity of supposing that the universals with which the mathematical science is conversant, are obtained by an abstraction from sensible objects, yet they are equally applicable to all other universals that are the proper objects of science.

" It remains then, says he, that we should consider what essence ought to be assigned to mathematical species and genera, and whether we are to admit that it derives its existence from sensibles, or from abstraction as it is called, or from a collection of particulars into one common definition; or must allow that it has a subsistence prior to sensibles, as Plato affirms, and as the progression of the whole of things demonstrates. In the first place, therefore, if we say that mathematical species subsist from sensibles, the soul fashioning in herself by a kind of secondary generation, the circular or trigonic form of the triangles or circles which are in matter, whence is the accuracy and indubitable certainty of definitions derived? For it must necessarily either proceed from sensibles, or from the soul. But it is impossible that it should proceed from sensibles; for these, in a continual flux of generation and decay, do not for a moment retain an exact sameness of being, and consequently fall far short of the accuracy contained in the definitions themselves. It must, therefore, proceed from the soul, which gives perfection to the imperfect, and accuracy to things inaccurate. For where among sensibles shall we find the impartible, or that which is without breadth or depth; where the equality of lines from the centre; where the ever stable proportions of sides; where the exact rectitude of angles? For my part, I cannot see where, since all divisible natures are mingled with each other, and nothing among these is genuine or pure from its contrary, but all of them are separable into parts, as well such as are removed from each other by interval, as those that are united. How, therefore, shall we obtain this stable essence for these immoveable natures, from things that are moved, and that subsist differently at different times? For every thing which derives its subsistence from mutable essences, is acknowledged to have a mutable existence. And how shall we gain this perfect accuracy for stable forms from things that are inaccurate? For whatever is the cause of a knowledge which is perpetually immutable, is in a greater degree immutable itself. It must be admitted, therefore, that the soul is generative of mathematical forms and reasons. But if indeed she possesses the paradigms of these, she gives subsistence to them essentially, so that the generations are the external processions of the preexistent forms she contains; and in thus speaking we shall accord with Plato, and discover the true essence of mathematical entities. If the soul, however, though she does not contain in herself mathematical forms and reasons, yet fabricates so great an immaterial order, and generates such an admirable theory, how will she be able to distinguish whether her productions are stable, or things which the wind may dissipate, and images instead of realities? By what rules can she measure their truth? And how, not containing the essence of them, can she generate such a variety of reasons? For from such an hypothesis, we shall make their subsistence fortuitous, and not tending to any bound. If, therefore, mathematical forms are the progeny of the soul, and she does not derive from sensibles the reasons she frames, the former are external processions from the latter, and are the parturitions of soul[5] who delivers her progeny into the fluctuating regions of matter, as the splendid fætus of permanent and perpetual forms.

In the second place, therefore, if we collect mathematical reasons from beneath and from sensibles, is it not necessary to call those demonstrations better than others, which are composed from sensibles, and not those which are always composed from more universal and more simple forms? For we say that causes every where in demonstrations should be adapted to the investigation of the thing sought. If, therefore, particulars are the causes of universals, and sensibles of the objects of the reasoning power, by what contrivance is it that the boundary of demonstration always refers to things which are more universal, instead of referring to particulars, and why is it that the essence of the objects of the reasoning power is shown to be more allied to demonstrations than that of sensibles? For they say[6], that his knowledge is not legitimately scientific, who demonstrates that the isosceles, or the equilateral, or the scalene triangle, has angles equal to two right, but he who demonstrates this of every triangle, and in short, who demonstrating possesses science (καθ'αυτο) essentially. And again they say, that universals are better than particulars for the purposes of demonstration; that the demonstrations of them are more universal; but that the things of which demonstrations consist, are prior to, and naturally precede particulars, and are the causes of the things demonstrated. It is very foreign, therefore, to the nature of demonstrative sciences, to collect their indubitable evidence from things of posterior origin, (τα υστερογενε [7].)

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[5] Proclus says this of the soul of the world; for though our souls essentially contain all forms prior to the energies of sense, yet in the present life these forms possess only a gnostic and not a fabricative power.

[6] See the Posterior Analytics of Aristotle.

Again, in the third place we say, that those who assert this make the soul to be more ignoble than material forms themselves. For if matter receives from nature things which have an essential subsistence, and which possess more of entity and evidence, but the soul afterwards fashions in herself from them idols and images of posterior origin, which have a more ignoble essence, abstracting from matter things which are naturally inseparable from it, do they not thus make the soul to be more inefficacious than matter, and subordinate to it? For matter indeed is the place of material reasons and forms, and the soul of such as are immaterial. But in this case, matter would be the receptacle of primary, and the soul of secondary forms; and the former would be the place of things which have a precedaneous subsistence, but the latter of things which derive their subsistence from matter. And the one would have an essential existence, but the others would only exist in the conceptions of the mind. How, therefore, is it possible that the soul which is the first participant of intellect, and an intellectual essence, and which is filled with knowledge from thence, and the whole of life, can be the receptacle of forms more obscure than those that are in matter, the ultimate seat of beings, and which possess the most imperfect existence of all things?"

Afterwards he shows, that mathematical forms, since they neither subsist by an ablation or abstraction from material natures, nor from a collection of things common in particulars, nor are in short things of posterior origin, and derived from sensibles,—since they are neither of these, they are generated by the soul from herself and from intellect, and the soul herself is a plenitude of forms. He then adds, "By no means, therefore, is the soul a tablet void of reasons and forms, but she is an ever-written tablet, herself inscribing the characters in herself, and which are also incribed by intellect. For soul also is an intellect evolving herself about an intellect prior to herself, and becoming the image and external type of it. Hence, if that is all things intellectually, soul is all things psychically, or in a manner adapted to the nature of soul; if the former is all things paradigmatically, the latter is all things iconically, or in the way of an image; and if all things subsist contractedly in the former, they subsist in the latter distributively. And this Plato perceiving, composes (in the Timæus) the soul of the world from all things, divides it according to numbers, binds it by analogies and harmonic reasons, and establishes in it the primary principles of figures, viz. the right and the circular line, and intellectually moves the circles it contains. All mathematical forms, therefore, have a primary subsistence in the soul, so that prior to sensible numbers there are in her inmost recesses self-moving numbers, vital figures prior to the apparent, harmonic reasons prior to things harmonized, and unapparent circles prior to the bodies that are moved in a circle. So that soul is the plenitude of all things, and another order producing herself, and also produced by her proper principle, filling herself with life, and at the same time filled from the fabricator of the universe incorporeally and without interval. When, therefore, she draws forth her latent reasons, she then causes all sciences and virtues to unfold themselves into light. Hence, the soul is essentialized in these forms, and neither must the number she contains be admitted to be a multitude of monads, nor must her [archetypal] idea of divisible natures be conceived corporeally, but all things must be understood as subsisting in her vitally and intellectually, and as the paradigms of apparent numbers and figures, reasons and motions." And in the last place he adds, "The reasons, therefore, of mathematical entities, which give completion to the soul, are essential and self-motive, which the reasoning power drawing forth and evolving, gives subsistence to all the variety of the mathematical sciences. Nor will the soul ever cease to generate and invent one science after another, while she evolves the impartible reasons she contains. For she previously received all things after a primary manner, and according to her infinite power from preexistent principles, produces all-various theorems into light."

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[7] These things of *posterior origin* are the abstract ideas of Mr. Locke; and they are evidently so called, because sensible objects, which are their sources, are prior to them.

The sagacious Kepler has not only inserted this part of the commentaries of Proclus, in the 4th book of his before-mentioned treatise "On the Harmonic World," but gives it the following encomium: "At quod attinet quantitates continuas, omnino adsentior Proclo; etsi oratio fluit ipsi torrentis instar, ripas inundans, et cœca dubitationum vada gurgitesque occultans, dum mens plena majestatis tantarum rerum, luctatur in angustiis linguæ, et conclusio nunquam sibi ipsi verborum copia satisfaciens, propositionum simplicitatem excedit[8]" i. e. "With respect to what pertains to continued quantities, I entirely assent to Proclus, though his language flows like a torrent, inundating its banks, and hiding the dark fords and whirlpools of doubts, while his mind, full of the majesty of things of such a magnitude, struggles in the straits of language, and the conclusion never satisfying him by the copia of words, exceeds the simplicity of the propositions."

The following arguments also are adduced against this absurd opinion, (first promulgated by certain pseudo Peripatetics, and afterwards renewed by Locke,) by the same admirable man in his inimitable MS. Commentary On the Parmenides of Plato.

"That it is not proper to stop at conceptions of posterior origin, or notions gained by an attraction from sensible particulars, but that we should proceed to those essential reasons which are allotted a perpetual subsistence within the soul, is evident to those who are able to survey the nature of things. For, whence is man able to collect into one by reasoning the perceptions of many senses, and to consider one and the same unapparent form prior to things apparent, and separated from each other; but no other animal that we are acquainted with, surveys this something common, for neither does it possess a rational essence, but alone employs sense, and appetite, and imagination? Whence, then, do rational souls generate these universals, and recur from the senses to that which is the object of opinion? It is because they essentially possess the gnostically productive principles of things; for, as nature possesses a power productive of sensibles, by containing reasons, or productive principles, and fashions and connects sensibles, so as by the inward eye to form the external, and in a similar manner the finger, and every other particular; so he who has a common conception of these, by previously possessing the reasons of things, beholds that which each possesses in common. For he does not receive this common something from sensibles; since that which is received from sensibles is a phantasm, and not the object of opinion. It likewise remains within such as it was received from the beginning, that it may not be false, and a non-entity, but does not become more perfect and venerable, nor does it originate from any thing else than the soul. Indeed, it must not be admitted that nature in generating generates by natural reasons and measures, but that soul in generating does not generate by psychical reasons and causes. But if matter possesses that which is common in the many, and this something common is essential, and more essence than individuals; for this is perpetual, but each of those is corruptible, and they derive their very being from this, since it is through form that every thing partakes of essence,—if this be the case, and soul alone possesses things common which are of posterior origin (ὑστερογενη κοινα), do we not make the soul more ignoble than matter? For the form which is merged in matter will be more perfect and more essence than that which resides in the soul; since the latter is of posterior origin, but the former is perpetual; and the latter is after and not connective of the many. To which we may add, that a common phantasm in the soul derives its subsistence from a survey of that which is common in particulars. Hence it tends to this; for every thing adheres to its principle; and is said to be nothing else than a predicate; so that its very essence is to be predicated of the many.

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[8] De Configurationibus Harmonicis, lib. 4, p. 118.

"Farther still, the universal in the many is less than each of the many; for by certain additions and accidents it is surpassed by every individual. But that which is of posterior origin (i. e. universal abstracted from particulars) comprehends each of the many. Hence, it is predicated of each of these; and that which is particular is contained in the whole of this universal. For this something common, or abstract idea, is not only predicated of that something common in an individual, but likewise of the whole subject. How then can it thence derive its subsistence, and be completed from that which is common in the many? For, if from the many themselves, where do we see infinite men, of all which we predicate the same thing? And if from that which is common in the many, whence is it that this abstract idea is more comprehensive than its cause? Hence, it has a different origin, and receives from another form this power which is comprehensive of every individual; and of this form the abstract idea which subsists in opinion is an image, the inward cause being excited from things apparent. To which we may add, that all demonstration, as Aristotle has shown in his Posterior Analytics, is from things prior, more honourable, and more universal. How, therefore, is universal more honourable, if it is of posterior origin? For, in things of posterior origin, that which is more universal is more unessential; whence species is more essence than genus. The rules, therefore, concerning the most true demonstration must be subverted, if we alone place in the soul universals of posterior origin: for these are not more excellent than, nor are the causes of, nor are naturally prior to, particulars. If, therefore, these things are absurd, it is necessary essential reasons should subsist in the soul, prior to the universals which are produced by an abstraction from sensibles. And these reasons or productive powers are indeed always exerted, and are always efficacious in divine souls, and in the more excellent orders of beings; but in us they are sometimes dormant, and sometimes in energy. Again, that the soul contains essential forms, and that, unless this be admitted, there can be no such thing as science, may be thus proved.

"If dianoëtic[9] and intellectual are better than sensible knowledge, it is necessary that the things known by the dianoëtic power, and by intellect, should be more divine than those which are known by sense:

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[9] Dianoëtic knowledge is the knowledge acquired by the reasoning power when energizing scientifically.

for, as the gnostic powers which are co-ordinated to beings are to each other, such also is the mutual relation of the things which are known. If, therefore, the dianoëtic power and intellect speculate separate and immaterial forms, and likewise things universal, and which subsist in themselves, but sense contemplates things partible, and which are inseparable from subjects, it is necessary that the spectacles of the dianoëtic power and of intellect should be more divine and more eternal. Universals, therefore, are prior to particulars, and things immaterial to things material. Whence, then, does the dianoëtic power receive these? for they do not always subsist in us according to energy. It is, however, necessary, that things in energy should precede those in capacity, both in things intellectual and in essences. Forms, therefore, subsist elsewhere, and prior to us, in divine and separate natures, through whom the forms which we contain derive their perfection. But these not subsisting, neither would the forms in us subsist: for they could not be derived from things imperfect: since it is not lawful that more excellent natures should be either generated or perfected from such as are subordinate. Whence, too, is this multitude of forms in the multitude of souls derived? For it is every where necessary, prior to multitude, to conceive a monad from which the multitude proceeds; for, as the multitude of sensibles was not generated, except from an unity, which is better than sensibles, and which gave subsistence to that which is common in particulars; so, neither would the multitude of forms subsist in souls, such as the just itself, the beautiful itself, &c. which subsist in all souls in a manner accommodated to the nature of soul, without a certain generating unity, which is more excellent than this psychical multitude: just as the monad from which the multitude of sensibles originates is superior to a sensible essence, comprehending unitedly all the variety of sensibles. Is it not also necessary that, prior to self-motive natures, there should be an immoveable form? For as self-motive reasons transcend those which are alter-motive, or moved by others, after the same manner immoveable forms, and which energise in eternity, are placed above self-motive forms which are conversant with the circulations of time: for it is every where requisite that a stable should precede a moveable cause. If, therefore, there are forms in souls which are many, and of a self-motive nature, there are, prior to these, intellectual forms. In other words, there are immoveable prior to self-motive natures, such as are monadic prior to such as are multiplied, and the perfect prior to the imperfect. It is also requisite that they should subsist in energy; so that if there are not intellectual neither are there psychical forms: for nature by no means begins from the imperfect and the many; since it is necessary that multitude should proceed about monads, things imperfect about the perfect, and things moveable about the immoveable. But if there are not forms essentially inherent in soul, there is no place left to which any one can turn his dianoëtic power, as Parmenides in Plato very justly observes: for phantasy and sense necessarily look to things connascent with themselves. But of what shall we possess a dianoëtic or scientific knowledge, if the soul is deprived of forms of this kind? For we shall not make our speculation about things of posterior origin, since these are more ignoble than sensibles themselves, and the universals which they contain. How then will the objects of knowledge, which are co-ordinate to the dianoëtic power, be subordinate to those which are known by sense? It remains, therefore, that we shall not know any thing else than sensibles. But if this be the case, whence do demonstrations originate? Demonstrations, indeed, are from those things which are the causes of the things demonstrated, which are prior to them according to nature, and not with relation to us, and which are more honourable than the conclusions which are unfolded from them. But the things from which demonstrations are formed are universals, and not particulars. Universals, therefore, are prior to, and are more causal and more honourable than, particulars. Whence, likewise, are definitions? For definition proceeds through the essential reason of the soul: for we first define that which is common in particulars, possessing within that form of which the something common in these is the image. If, therefore, definition is the principle of demonstration, it is necessary that there should be another definition prior to this, of the many forms and essential reasons which the soul contains; for since, as we

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have before said, the just itself is in every soul, it is evident that there is something common in this multitude of the just, whence every soul, knowing the reason of the just contained in its essence, knows, in a similar manner, that which is in all other souls. But, if it possesses something common, it is this something common which we define, and this is the principle of demonstration, and not that universal in the many, which is material, and in a certain respect mortal, being co-ordinated with the many: for, in demonstrations and definitions, it is requisite that the whole of that which is partial should be comprehended in universal and definition. But the definitions of things common in particulars do not comprehend the whole of particulars; for, can it be said that Socrates is the whole of rational mortal animal, which is the definition of man? since he contains many other particulars, which cause him to possess characteristic peculiarities. But the reason of man in the soul comprehends the whole of every individual; for it comprehends uniformly all the powers which are beheld about the particulars of the human species; And in a similar manner with respect to animal; for, indeed, the universal in particulars is less than the particulars themselves, and is less than species; since it does not possess all differences in energy, but in capacity alone: whence, also, it becomes as it were the matter of the succeeding formal differences. But the reason of man in our soul is better and more comprehensive; for it comprehends all the differences of men unitedly, and not in capacity, like the universal in particulars, but in energy. If, therefore, definition is the principle of demonstration, it is requisite that it should be the definition of a thing of that kind, which is entirely comprehensive of that which is more partial. But of this kind are the forms in our soul, and not the forms which subsist in particulars. These, therefore, being subverted, neither will it be possible to define. Hence, the definitive together with the demonstrative art will perish, abandoning the conceptions of the human mind. The divisive art, also, together with these will be nothing but a name: for the whole employment of divisions is to separate the many from the one, and to distribute things pre-subsisting unitedly in the whole, into their proper differences, not adding the differences externally, but contemplating them as inherent in the genera themselves, and as dividing the species from each other. Where, therefore, will the work of this art be found, if we do not admit that there are essential forms in our soul? For he who supposes that this art is employed in things of posterior origin, i. e. forms abstracted from sensibles, perceives nothing of the power which it possesses: for, to divide things of posterior origin, is the business of the divisive art, energising according to opinion; but, to contemplate the essential differences of the reasons in the soul, is the employment of dianoëtic and scientific division, which also unfolds united powers, and perceives things more partial branching forth from such as are more total. By a much greater priority, therefore, to the definitive and demonstrative arts will the divisive be entirely vain, if the soul does not contain essential reasons: for definition is more venerable, and ranks more as a principle, than demonstration, and, again, division than definition: for the divisive gives to the definitive art its principles, but not vice versa. The analytic art also, must perish together with these, if we do not admit the essential reasons of the soul. For, the analytic is opposed to the demonstrative method as resolving from things caused to causes, but to the definitive, as proceeding from composites to things more simple, and to the divisive, as ascending from things more partial to such as are more universal. So that, those methods being destroyed, this also will perish. If, therefore, there are not forms or ideas, neither shall we contain the reasons or gnostically productive principles of things. And, if we do not contain the reasons of things, neither will there be the dialectic methods according to which we obtain a knowledge of things, nor shall we know where to turn the dianoëtic power of the soul.

The following arguments, also, collected from the notes to my translation of the Metaphysics of Aristotle, are added in confutation of this dogma of Locke. We neither behold all the figures, nor all the numbers contained in sensibles, nor is it possible for things derived from sensibles to possess mathematical accuracy and certainty. But if it should be said, that we add what is wanting, and make the things abstracted from sensibles more certain, and after this manner consider them; in the first place, indeed, it is requisite to say whence we derive the power of thus giving them perfection. For we shall not find any more true cause than that assigned by the antients; I mean, that the soul, prior to the energies of sense, essentially contains the reasons of all things. But, in the next place, by adding something to the things abstracted from sensibles, we do not make them more certain and true, but, on the contrary, more fictitious. For, if any one blames the person of Socrates, while he accurately preserves in his imagination the image which he has received from the sensible Socrates, he will have an accurate knowledge of his person; but if he wishes to transform it into a more elegant figure, he will rather consider the transformed figure than the form of Socrates. But nothing of this kind takes place in equal and similar numbers and figures; but by how much the nearer we bring them to the more certain and perfect, they become by so much the more manifest and known, in consequence of approaching so much the nearer to their own impartible form. We may say, indeed, that we are excited to the perception of mathematical truths by sensible objects; but it must by no means be admitted that they derive their subsistence by an abstraction from sensibles. For the forms, indeed, which are transmitted to us through the senses, may proceed as far as to the imagination, in which they wish to retain an individual subsistence, and to continue such as they entered. When intellect, however, afterwards passes beyond these to universal, and to things which are apprehended by scientific reasoning, it plainly evinces that it considers objects allied to itself, and which, indeed, are its legitimate progeny. Hence, this energy is emulous of divine energy and not laborious, and has a power of exciting, purifying, and enlightening the dianoëtic eye of the soul, which is blinded and buried by studies of a different kind. But how could this be effected, if it were employed about things which alone subsist by a denudation from sensibles? The contrary to this, indeed, would rather be effected; the splendid eye of intellect would be darkened and fixed in body, and its native tendency to true beings restrained, by being busily employed, as in the perception of shadows, about things of posterior origin, dark imitations of reality, and more vile than matter itself.

In short, one of these two things must follow: either that mathematical demonstrations are less certain than physical reasons, or that mathematical sciences are conversant with things which possess more reality than physics. For it is not reasonable to suppose that things which have more of reality should be more obscurely known, not that things which are less real should be more manifestly known. But whenever this happens in the speculation of any intelligible essence, it is the consequence of our imbecility, and does not arise from the thing itself: for the assertion of Plato in this respect is most true, that every thing participates of splendor and knowledge in proportion as it participates of truth and being. The same thing also is manifestly asserted by Aristotle in the second book of his Metaphysics; for he there expressly says, "*As is the being of every thing, such also is its truth.*" So that it clearly follows, that sensible objects have less reality than mathematical entities.

Again, if we have another eye besides that of sense, it must have a power perceptive of those forms which are the proper objects of its vision. For if the universals which are beheld by the intellectual eye are merely things abstracted from sensible objects, and therefore of an origin posterior to sensibles themselves, things which have no real subsistence will be the spectacles of intellect. Will not, therefore, that most excellent part of us, intellect, be more unhappy than the sensible eye, since this is co-ordinated to beings; or, in other words, contemplates objects which have the same reality of subsistence with itself; while on the contrary, intellect will be the spectator of delusion and non-entity? But if this is absurd, and we have an intellectual eye endued with a visive power, there must be forms conjoined with this power, immoveable indeed according to corporeal motion, but moved with intellectual energy.

I have already observed, that the doctrine that the soul has no conception of any other universals than those ideas which are abstracted from sensibles, and which are therefore called by Mr. Locke, abstract ideas, is an ancient dogma, and not the invention of Locke. That this assertion is true is evident from the following extract from the Commentaries of Syrianus On the Metaphysics of Aristotle[5]; in which extract, also, the mode of the subsistence of ideas in divinity, according to Orpheus and Pythagoras, is admirably unfolded.

Syrianus then shows, in defence of Socrates, Plato, the Parmenidæans and Pythagoræans, that ideas were not introduced by these divine men, according to the usual meaning of names, as was the opinion of Chrysippus, Archedemus, and many of the junior Stoics; for ideas are distinguished by many differences, from things which are denominated from custom. Nor do they subsist together with intellect, in the same manner as those slender conceptions, which are commonly called abstract ideas, or universals abstracted from sensibles, which was the hypothesis of Longinus: for, if that which subsists is unsubstantial, it cannot be consubsistent with intellect. Nor are ideas according to these men *notions*, as Cleanthes afterwards asserted them to be. Nor is idea, definite reason, nor material form, and the object of definition, as here and elsewhere Aristotle pretends it is, according to Socrates; for these indeed subsist in composition and division, and verge to generation and matter. But ideas are perfect, simple, immaterial and impartible natures. And what wonder is there, says Syrianus, if we should separate things which are so much distant from each other? Since neither do we imitate in this particular those Platonists, Plutarch, Atticus, and Democritus[6], who, because universal reasons perpetually subsist in the essence of the soul, were of opinion that these reasons are ideas: for though they separate them from the universals in sensible natures, yet it is not proper to conjoin in one and the same, the reasons of soul, and an intellect such as ours which is called material, with paradigmatic and immaterial forms, and demiurgic intellections.

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[5] See p. 396, Vol. 9, of my translation of the Works of Aristotle.

[6] This must be a Democritus posterior to the celebrated atomic philosopher of that name; for he was not a Platonist, and was contemporary with Plato.

But, as the divine Plato says, it is the province of our soul to collect things into one by a reasoning process, and to possess a reminiscence of those transcendent spectacles which we once beheld, when governing the universe in conjunction with Divinity. Boethus, the peripatetic, too, with whom it is proper to join Cornutus, thought that ideas were the same with the universals in sensible natures. However, whether these universals are prior to particulars, they are not prior in such a manner as to be denudated from the habitude which they possess with respect to them, nor do they subsist as the causes of particulars; both which are the prerogatives of ideas: or whether they are posterior to particulars, as many are accustomed to call them, how can things of posterior origin, which have no essential subsistence, but are nothing more than slender conceptions, sustain the dignity of demiurgic ideas?

In what manner, then, do ideas subsist according to the contemplative lovers of truth? We reply, intelligibly and tetradically (νοητως και τετραδικως) in *animal* itself (εν τῳ αυτοζωῳ) or the extremity of the intelligible order[7]; but intellectually and decadically (νοερως και δεκαδικως) in the intellect of the artificer of the universe: for, according to the Pythagoric hymn, "Divine number proceeds from the retreats of the undecaying monad, till it arrives at the divine tetrad which produced the mother of all things, the universal recipient, venerable, circularly investing all things with bound, immoveable and unwearied, and which is denominated the sacred decad, both by the immortal gods and earth-born men."

προεισι γαρ ὁ θειος αριθμος, ὡς φησιν ὁ Πυθαγορειος εις αυτον ὑμνος,

Μοναδος εκ κευθμωνος ακηρατου εστ' αν ικηται
Τετραδα επι ζαθεην, ἡ δη τεκε μητερα παντων,
Πανδεχεα, πρεσβειραν, ὁρον περι πασι τιθεισαν,
Ατροπον, ακαματον, δεκαδα κλειουσι μιν αγνην
Αθανατοι τε θεοι και γηγενεις ανθρωποι[8].

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[7] For an account of this order, see my Introductions to the Timæus and Parmenides of Plato.

[8] Proclus in Tim. p. 269. But the last line is from Syrianus.

And such is the manner of their subsistence according to Orpheus and Pythagoras. Or, if it be requisite to speak in more familiar language, an intellect sufficient to itself, and which is a most perfect cause, presides over the wholes of the universe, and through these governs all its parts; but at the same time that it fabricates all mundane natures, and benefits them by its providential energies, it preserves its own most divine and immaculate purity; and while it illuminates all things, is not mingled with the natures which it illuminates. This intellect, therefore, comprehending in the depths of its essence an ideal world, replete with all various forms, excludes privation of cause, and casual subsistence, from its energy. But as it imparts every good and all possible beauty to its fabrications, it converts the universe to itself, and renders it similar to its own omniform nature. Its energy, too, is such as its intellection; but it understands all things, since it is most perfect. Hence, there is not any thing which ranks among true beings, that is not comprehended in the essence of intellect; but it always establishes in itself ideas which are not different from itself and its essence, but give completion to it, and introduce to the whole of things a cause, which is at the same time productive, paradigmatic, and final: for it energizes as intellect; and the ideas which it contains are paradigmatic, as being forms; and they energize from themselves, and according to their own exuberant goodness. And such are the dogmas which he who truly opposes the advocates for the doctrine of ideas ought to confute; but which Aristotle does not any where attempt to contradict.

CHAPTER XIII.

Having, therefore, in the former part of this work evinced the great excellence of the philosophy of Aristotle, by the elucidation of the principal dogmas of his Physics and Metaphysics, and in the latter part shown the fallacy and nothingness of the modern philosophy, I shall conclude this volume with some general remarks on the philosophy of Plato and Aristotle, on the patrons of my translation of Aristotle's works, and on the translation itself.

This philosophy, then, from its sublimity, may, in the language of Plato, be truly said to be the greatest good that was ever imparted by God to man; for as it purifies us from the defilements of the passions, and assimilates us to divinity, it confers on us the proper felicity of our nature. Hence, it is justly said by Hierocles[1] to be the purification and perfection of human life. It is the purification indeed, from material irrationality, and the mortal body; but the perfection, in consequence of being the resumption of our proper felicity, and a reascent to the divine likeness. To effect these two is the province of *Virtue* and *Truth*; the former exterminating the immoderation of the passions; and the latter introducing the divine form to those who are naturally adapted to its reception. "This philosophy, Proclus elegantly observes, shone forth at first from Plato, so venerably and occultly, as if securely established in sacred temples and their secret recesses, and being unknown to many who have entered into these holy places, in certain orderly periods of time, proceeded as much as was possible for it into light, through certain sacred priests, who embraced a life corresponding to the tradition of such mystic concerns." He adds, "It likewise appears to me, that the whole place became splendid, and that illuminations of divine spectacles every where presented themselves to the view[2]." And in the beginning of his MS. Commentary On the Parmenides of Plato, he says of this philosophy, "that it came to men for the benefit of terrestrial souls, instead of statues, instead of temples, instead of the whole of sacred institutions, and that it is the leader of salvation to the men that now are, and to those that shall exist hereafter[3]."

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[1] In Aur. Carm. p. 9. edit. Needh.

[2] *ουτω δε σεμνως, και απορρητως υπ᾽ αυτου την πρωτην εκλαμψασαν οιον αγιοις ιεροις, και των αδυτων εντος ιδρυνθεισαν ασφαλως, και τοις πολλοις των εισιοντων αγνοηθεισαν, ασφαλως εν τακταις χρονων περιοδοις υπο δη τινων ιερεων αληθινων, και τον προσηκοντα τη μυσταγωγια βιον ελομενων, προελθειν μεν, εφ᾽ οσον ην αυτη δυνατον. απαντα δε καταλαμψαι τον τοπον, και πανταχου των θειων φασματων ελλαμψεις καταστησασθαι.* [1] In Plat. Theol. p. 1.

The mode however in which this philosophy is promulgated in the writings of its two great luminaries differs considerably. For in those of Plato it is delivered more theologically, in those of Aristotle more physically. In the former it is more divine, in the latter more human. In the former science is accompanied with the arcane and the mystic, and with the graces and magnificence of diction; but in the latter science is seen in the simple unadorned garb of reason, accompanied solely with verbal obscurity, in order to prevent the impertinent familiarity of the rabble. Hence the writings of the latter are introductory to those of the former, and have the same relation to them, that the less had to the greater mysteries.

However paradoxical too the assertion may seem, it was doubtless owing to the writings of Aristotle alone, that in the dark ages after the destruction of the schools of the Greek philosophers, the nations of Europe, though in a barbarous were not in a savage state. For that geometrical method of reasoning with which the works of Aristotle so remarkably abound, was not wholly abandoned by the schoolmen, though it was greatly perverted by them. In consequence of exercising themselves so much in his logic their reasoning as to its syllogistic form was indeed accurate, but as to its principles was erroneous. As reason however is the characteristic of human nature, the exercise of it though it should happen to be attended for the most part with error, prevents it from remaining in a dormant state, and preserves the man from sinking into the brute. Instead therefore of blaming Aristotle, as Lord Bacon does, for mingling logic with his natural philosophy, it is a thing for which he deserves the highest praise. For truth of every kind is only to be discovered by the proper exercise of the reasoning power; and this power can alone be exercised rightly in the way which Aristotle has prescribed and unfolded in his logical treatises.

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[3] ον εγω φαιην αν φιλοσοφιας τυπον εις ανθρωπους ελθειν, επ' ευεργεσια των τηδε ψυχων, αντι των αγαλματων, αντι των ιερων, αντι της ολης αγιστειας αυτης, και σωτηριας αρχηγον τοις γε νυν ανθρωποις, και τοις αυθις γενησομενοις. Proclus in this passage alludes I suppose to the great destruction of the temples of the Heathens in his time, and to the great probability that the religious rites and ceremonies of the Greeks, would in succeeding periods be entirely abolished. This admirable passage forms the Greek motto to this volume.

It is well observed, therefore, by the author of Reflections on Ancient and Modern Philosophy, "That Aristotle's method of attaining science by the evidence of demonstration, and of proceeding geometrically to demonstration by the infallibility of syllogism, is the most accomplished work, and the greatest attempt of the wit of man." He adds, "The art and method of the logic of Aristotle is so sure, that without it a man can have no perfect assurance in reasoning, and that it is a rule to make men just and exact in conceiving what is to be conceived.—In fine, that pure geometrical method of demonstration which he followed, has appeared always so exact, that it has been used by the learned in all sciences, as the most solid, and most consonant to the usual manner of reasoning; and that construction of syllogism, which is the true logic of Aristotle, is so perfect in its kind, that nothing has been since added to it, or diminished from it, without corrupting the same. Men of sound judgment can admit of no other manner, nor any other principles of reasoning than those of Aristotle. And seeing in all ages men have disputed against reason, because it is opinion commonly that sways the world; the learned ages have only been distinguished from others, by the esteem they have had of the logic of Aristotle. For to speak the truth, what he has done for the rectifying of reason, by cutting off equivocation from terms, and confusion from conceptions, is one of the greatest master-pieces of human reason *."

In another part also of the same work he observes: "After the writings of Aristotle, which were so long concealed, were discovered, and his method was known, men addicted themselves to it in succeeding times, as to the solidest and surest of all: the art of thinking and discoursing appearing in it, in its highest perfection, by the invention of syllogism; to which all the meditation and reflection of philosophers

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* Reflections on Ancient and Modern Philosophy; London, 1686. p. 106. &c.

can add nothing. Galen himself, who had entertained other notions in logic, and who had composed a new dialectic which is lost, followed at last that of Aristotle, and gave it even applause and reputation; and that new figure of syllogism which he invented, passed only for an indirect method of demonstration.——It is even true, that there has been nothing said rationally since on that science, which Aristotle had not thought on before: and it may be affirmed, that there has scarcely been any new thing discovered, in the universal economy of the operations of the mind, since that philosopher has written on it.—I shall say nothing of the logic of Raymund Lully, which is but the mere gibberish of the cabal, and a raking up of words in an order that is but arbitrary, and which has nothing of reality. It is an art of speaking of all things without judgement, and of discoursing at random as much as men please. In fine, it is a very extravagant notion of logic, which Peter Montuus pretends to have been copied from head to tail, from an Arabian philosopher called Abezebron, proper to puzzle Antichrist when he comes into the world. Upon this fair original Raymond Lully formed the idea of his logic, which could never as yet make men any thing but enthusiasts or ignorant. About two hundred years ago Laurentius Valla undertook to reform the logic of Aristotle, by reducing the ten categories to three, and cutting off the third figure of syllogism. He succeeded not in that boldness, for he had no followers. Ludovicus Vives undertook another reformation, which concerned the schoolmen more than Aristotle; but likewise without success. Ramus had no better luck in his design of overthrowing the credit of Aristotle, upon the memoirs of Valla and Vives. For the idea that he had conceived of his new dialectic contains nothing rational, but what he had borrowed from the dialectic of Aristotle, which he had corrupted by endeavouring to reform it. Cardan composed a logic upon the logic of Aristotle, of Hippocrates, of Euclid, of Ptolemy, and of Galen; but that work has nothing in it that is good, except what he has taken from the geometrical method of Aristotle, which he brings into it."

In praise also of the philosophy of Plato and Aristotle, Bishop Berkeley observes in his Siris (p. 158) as follows: "Prevailing studies are of no small consequence to a state, the religion, manners and civil government of a country ever taking some bias from its philosophy, which affects not only the minds of its professors and students, but also the opinions of all the better sort, and the practice of the whole people, remotely and consequentially indeed, though not inconsiderably. Have not the polemic and scholastic philosophy been observed to produce controversies in law and religion? And have not fatalism and Sadducism gained ground, during the general passion for the corpuscularian and mechanical philosophy, which has prevailed for about a century? This indeed might usefully enough have employed some share of the leisure and curiosity of inquisitive persons. But when it entered the seminaries of learning as a necessary accomplishment, and most important part of education, by engrossing men's thoughts, and fixing their minds so much on corporeal objects, and the laws of motion, it has, however undesignedly, indirectly, and by accident, yet not a little indisposed them for spiritual, moral, and intellectual matters. Certainly had the philosophy of Socrates and Pythagoras prevailed in this age, we should not have seen interest take so general and fast hold on the minds of men, nor public spirit reputed to be χενναιαν ευηθειαν, a generous folly, among those who are reckoned to be the most knowing as well as the most getting part of mankind.

"It might very well be thought serious trifling to tell my readers that the greatest men had ever an high esteem for Plato; whose writings are the touchstone of a hasty and shallow mind; whose philosophy has been the admiration of ages; which supplied patriots, magistrates, and lawgivers to the most flourishing states, as well as fathers to the church, and doctors to the schools. *Albeit in these days, the depths of that old learning are rarely fathomed, and yet it were happy for these lands, if our young nobility and gentry, instead of modern maxims, would imbibe the notions of the great men of antiquity. But in these free-thinking times many an empty head is shook at Aristotle and Plato, and the writings of those celebrated*

celebrated ancients are by most men treated on a foot with the dry and barbarous lucubrations of the schoolmen. It may be modestly presumed, there are not many among us, even of those who are called the better sort, who have more sense, virtue, and love of their country, than Cicero, who in a letter to Atticus could not forbear exclaiming, O Socrates! et Socratici viri! nunquam vobis gratiam referam. Would to God many of our countrymen had the same obligations to those Socratic writers. Certainly where the people are well educated, the art of piloting a state is best learned from the writings of Plato. But among bad men, void of discipline and education, Plato, Pythagoras and Aristotle themselves, were they living, could do but little good. Plato has drawn a very humorous and instructive picture of such a state; which I shall not transcribe for certain reasons. But whoever has a mind may see it in the seventy-eighth page of the second tome of Aldus's edition of Plato's works[5]."

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[5] The passage here alluded to by Bishop Berkeley is, I have no doubt, the following (for I have not the Aldine edition of Plato to consult), which the reader may find in the 6th book of the Republic, Tom. II. p. 14, of Massey's edition:

"The sufferings of the most worthy philosophers in the management of public affairs are so grievous, that there is not any other suffering so severe: but in making our simile, and apologizing for them, we must collect from many particulars, in the same manner as painters mix the figures of two different animals together, and paint a creature, which is both goat and stag in one, and others of this kind. Conceive, now, that such a one as this is the pilot of a fleet, or of a single ship, *one who exceeds all in the ship, both in bulk and strength, but is somewhat deaf, and sees in like manner but a short way, and whose skill in sea affairs is much of the same kind**. Conceive, likewise, that the sailors are all in sedition among themselves, contending for the pilotship, *each imagining that he ought to be a pilot, though he never learned the art, nor is able to show who was his master, nor at what time he learned it.* That, besides this, all of them say that the art itself cannot be taught, and are ready to cut in pieces any one who says that it can. Imagine further, that they continually surround the pilot himself, begging and doing every thing that he may put the helm into their hands; and that even sometimes when they are not so successful in persuading him as others are, they either kill these others, or throw them overboard; and after they have by mandragora, or wine, or some other thing, rendered the *noble* pilot incapable, they manage the ship with the assistance of the crew, and whilst they drink and feast in this manner, they sail as it may be expected of such people. And besides these things, if any one be dexterous in assisting

* Pitt and Fox, in this country, appear to have been political pilots of this description.

them

Since philosophy, therefore, as Berkeley well observes (who appears to me to have been the most intelligent Bishop that ever lived except Synesius(6)),

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them to get the government into their own hands, and in setting aside the pilot, either by persuasion or force, they commend such a one, calling him sailor and pilot, and intelligent in navigation; but they contemn as useless every one who is not of this kind, *whilst they never in the least think that the* TRUE PILOT *must necessarily pay attention to the year, the seasons, the heavens, and stars, and winds, and every thing belonging to the art, if he intends to be a governor of a ship in reality* *: but the art and practice of governing men, whether some one be willing or not, they think impossible for a man to attain in conjunction with the art of navigation. Whilst affairs are in this situation, with regard to the ships, do you not think that the *true pilot* will be called, by the sailors a-board of ships fitted out in this manner, a star-gazer, insignificant, and unprofitable to them? Undoubtedly, said Adimantus. I think then, said I, that you will not want any explanation to see that it represents how they are affected in cities towards *true philosophers*, but that you understand what I say. Perfectly, said he."

What could be the reason that induced Berkeley not to transcribe this passage? If it was through the fear of offending the then existing administration, it was a reason that ought only to be expected from a shop-keeper.

[6] Synesius was originally a Platonic philosopher, and though he consented to become a bishop, yet there were certain Platonic doctrines contrary to the tenets of the Christian religion, which he determined not to abandon. For, in his 105th Epistle, he says to his brother on the subject of his being made a bishop, "That it is difficult, if not even extremely impossible, for dogmas to be shaken that have been introduced into the soul *through science, and are accompanied with demonstration.* But you know that philosophy is in many respects adverse to these dogmas that are dispersed among the Christians. *I certainly shall never think it right to believe that the soul is produced posterior to the body; nor shall I say that the world and its parts will be corrupted together.* χαλεπον εστιν, ει μη και λιαν αδυνατον, εις ψυχην τα δι επιστημης εις αποδειξιν ελθοντα δογματα σαλευθηναι. οισθα δ'οτι πολλα φιλοσοφια τοις θρυλλουμενοις τουτοις αντιδιαταττεται δογμασιν. αμελει την ψυχην ουκ αξιωσω ποτε σωματος υστερογενη νομιζειν· τον κοσμον ου φησω και τ'αλλα μερη συνδιαφθειρεσθαι. He adds, *that if this method* (that is, of concealing the truth) *be consistent with the laws of episcopal dignity, he may be consecrated. That he shall philosophize at home, and tell fables abroad; neither teaching nor unteaching, but suffering people to live in their former opinions.* ει ταυτα και οι της καθ' ημας ιερωσυνης συγχωρουσιν εμοι νομοι, δυναιμην αν ιερασθαι, τα μεν οικοι φιλοσοφων, τα δ'εξω φιλομυθων, ει μη διδασκων αλλ' ουδε μεντοι μεταδιδασκων, μενειν δε εων επι της προληψεως.

From his Epistles, also, it appears that he lamented his episcopal station, as he frequently and earnestly begs to be discharged from his office; and declares, that as he was by education a heathen, and by profession a philosopher, he had met with no success since he presumed to serve at the

* Viz. The *true pilot* must be a man *scientifically* skilled in the art of government, and not like the deaf and short-sighted pilot above-mentioned.

altar.

is of no small consequence to the religion, manners, and civil government of a country, surely such a philosophy as that of Plato and Aristotle, which has for its end perfection through the virtues, and a union with the one principle of all things, cannot be too much applauded, or too earnestly recommended to the attention of statesmen, and those who wish to arrive at the summit of philosophic attainments. The reader, from the specimen I have given of modern philosophy, is, I trust, fully convinced, that as it ends in nothing but conjecture, and the gratification of idle and puerile curiosity, the substitution of another is indispensably necessary. And where can one be found more accurate, more scientific, and more holy, than the philosophy of Plato and Aristotle?

It must doubtless seem singular in the extreme to those who are not adepts in this philosophy, that being thus admirable and of such exalted worth, there should have been so great an ignorance of it, as I have shown from indubitable evidence there has been for so many ages. But the wonder will cease, when it is considered, that the order and method of study enjoined by its great masters, as essentially necessary to the attainment of it, has been entirely neglected. Thus, for instance, men have either applied themselves to certain portions only of the works of Aristotle, and thus from knowing something of a part, and this very imperfectly, have presumed to judge of the whole of his philosophy; or, if they have studied him regularly, which no one appears to have done since the time of the schoolmen, and they barbarized him, they have dissociated him from Plato, and have thus deteriorated the philosophy of the Stagirite, perverted his real meaning, and consequently have made no solid proficiency in the knowledge of his doctrines. To which may be added, as another most principal cause of this ignorance, the neglecting to study the commentaries of his Greek disciples. For, indeed, to attempt at this distance of time, to read

altar. Particularly in a letter to his friend Olympius (Epist. 95) he declares, that if his duty as a bishop should be any hindrance to his philosophy, he would relinquish his diocese, abjure his orders, and remove into Greece. For farther particulars about Synesius, see the Clydophorus and Hypatia of Toland, who largely and curiously descants on his life and writings.

Aristotle, who wrote, as we have shown with a studied obscurity of diction, without the assistance of these commentaries, must be the result of the most lawless arrogance and the most consummate folly. And the same remark equally applies to the writings of Plato, which, like those of Homer, as Olympiodorus well observes, are to be considered physically, ethically, theologically, and, in short, multifariously. For will any man of the present period be hardy enough to say that he understands the Greek tongue so well as they did, to whom it was native? Or, that he has the means of acquiring such information respecting it, as they had, who had books to consult written by the immediate disciples of Plato and Aristotle, but which have been lost for more than a thousand years; who besides this had a traditional knowledge of that philosophy; and who are acknowledged to have been men of great learning and genius? It has become the fashion however with hireling writers to decry them; but from whom and when the defamation originated I know not; though, as I have elsewhere observed, whatever was its source, it is no less contemptible than obscure. Hence the beautiful light which they benevolently disclosed, has hitherto unnoticed illumined Philosophy in her desolate retreats, like a lamp shining on some venerable statue amidst dark and solitary ruins[7]. Another, and that no small cause of this ignorance, has been the want of those mental qualifications, which Plato enumerates as essential requisites to the attainment of perfection in his philosophy. For, according to him, he who sufficiently applies himself to the study of it, must be naturally possessed of a good memory, learn with facility, be magnificent and graceful, and the friend and ally of truth, justice, fortitude and temperance[8]. At the best of times men of this description will be rare;

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[7] See the Introduction to the philosophy and writings of Plato prefixed to my translation of his works.

[8] See the 7th book of the Republic.

but in periods which, from a variety of circumstances, are hostile to genuine philosophy, and such have all the periods been since the destruction of the Greeks, they will necessarily be rare in the extreme[9].

Indeed, so great has been the ignorance, particularly in more modern times, of the writings of Aristotle, that some persons, as Heinsius and Dr. Gillies, did not even know that he wrote with studied obscurity of diction, but have celebrated him for the perspicuity of his language. Thus Heinsius, in the Dedication to his version of the Paraphrase On the Nicomachean Ethics of Aristotle by an Anonymous Greek writer, says: "Atqui profecto aut vehementer fallunt nos veteres, aut præcipua Aristotelicæ orationis virtus est σαφηνεια, ut recte monet vir magnus Halicarnassensis Dionysius: neque in rebus ipsis tanta esse potest obscuritas, cum nec *prolixè*, et divino proponantur ordine.——Fateor summam orationis esse brevitatem, fateor concisum esse dicendi genus, quod quemadmodum nullo negotio à linquæ illius perito, et Aristotelici characteris familiari, percipi potest, ita cum in alium transfertur sermonem, non illustratur sed involvitur; et una cum proprietate vim quoque amittit et efficaciam."—i. e. "And indeed, either the ancients very much deceive us, or the chief virtue of Aristotle's diction is perspicuity, as that great man Dionysius Halicarnassensis rightly admonishes: nor can there be in the things themselves such great obscurity, since they are proposed without prolixity, and in a divine order.—I confess that there is the greatest brevity in his language, and that he employs a concise kind of diction, which as it may be easily understood by one who is skilled in the Greek tongue, and who is familiar with the Aristotelian character of writing, so when it is translated into another language, is not illustrated, but rendered intricate; and together with propriety, loses also its power and efficacy." Poor Heinsius! How egregiously was he mistaken in asserting thus generally, that the chief virtue of Aristotle's diction is perspicuity. For this is true only of his popular and not of his acroamatic writings, as we have before observed in p. 5, of this Dissertation. And with respect to the authority of Dionysius Halicarnassensis, which Heinsius adduces in support of his opinion, however great it may be on such subjects as rhetoric, poetry and history, it is nothing where philosophy is concerned; and the acroamatic writings of Aristotle are deeply philosophical. To which may be added, that Dionysius had doubtless the rhetoric of Aristotle solely in view, when he gave this encomium of his style. And as to the ignorance of Dr. Gillies in this respect, it is far beyond that of Heinsius, who was uncommonly skilled in the Greek language, and was perhaps one of the greatest verbalists of modern times. Heinsius therefore only wanted a knowledge of the philosophy of Aristotle, and not a knowledge of the Greek tongue, but Dr. Gillies wanted both, when he praised Aristotle for the perspicuity of his diction. In proof of what I have asserted, I give the following extract from my Answer to Dr. Gillies's Supplement to his New Analysis of Aristotle's Works[1]. "I think it may be fairly presumed, that the man who is so ignorant of the style of Aristotle in his acroamatic writings, as not to know that it is remarkably obscure, cannot by any means have penetrated the depth which those writings contain. That he [i. e. Dr. Gillies] did not know this is abundantly evident from the following passage, in which also from his inability to correct a very obvious error in the Greek text of a quotation from Simplicius, he has made that philosopher contradict himself. The passage I allude to is in a Note to the Supplement of his Analysis, p. 215-8. That he (Simplicius), says the Dr., gave into the mode of allegorical interpretation, appears from the following short sentence, containing the just praise of Aristotle's perspicuity: ουδε μυθοις, ουδε συμβολικοις αινιγμασι ως των προ αυτου τινες εχρησαντο, αλλ' αντι παντος αλλου περιπετασματος την σαφειαν προετιμησε. Simplic. in Proœm. Lib. των κατηγοριων. i. e. "He made not any use of fables, or dark symbols, like some philosophers before him, but preferred perspicuity to every other ornament." Strange! that Simplicius should praise Aristotle for his perspicuity, when, in another place quoted by Dr. Gillies, he says, that Aristotle was purposely obscure in his acroamatic writings, "ut segnores ab eorum studio repelleret et dehortaretur." Simplic. ad Auscult. Physic. fol. 2. See p. 23 of the life of Aristotle prefixed to the translation of his Ethics, by Dr. Gillies, 8vo. It is evident therefore, that in the above passage, for περιπετασματος, we should read παραπετασματος[a], and for σαφειαν ασαφειαν, and then Simplicius will speak accurately and consistently, and the translation of the whole passage will be as follows: "Aristotle neither employed fables nor symbolical enigmas, like some philosophers before him, but preferred obscurity to every other veil." That this is the true reading is likewise evident from an ancient Latin version of Simplicius on the Categories, printed at Venice 1588 folio, in which the above passage is thus translated: Verumtamen neque fabulis, neque ænigmatibus, conjecturis metaphorisque implicitis, quemadmodum nonnulli ante ipsum usus est, sed pro omni alio velamine et involuto dicendi modo obscuritatem maxime laudavit et probavit." It is likewise indisputably manifest, from what immediately follows this passage, in which Simplicius investigates the reason why Aristotle adopted this mode of writing, as the learned reader who has the original in his possession will immediately perceive. It may be fairly concluded, therefore, that Dr. Gillies knew not that it was the general practice of the earliest philosophers of antiquity to employ different modes of concealing their wisdom from the vulgar, and that Aristotle adopted for this purpose obscurity of diction, though the former particular is well known to every tyro in the history of philosophy, and the latter is obvious to the meanest capacity."

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[9] It is well observed, therefore, by Simplicius, in his most excellent commentary on Epictetus, "That more depraved polities are wholly noxious to souls, that they especially repress divine illumination, despise pursuits that are of a more beautiful nature, and obliterate the paradigms of rectitude of life." He adds, "Hence also they are in short an impediment to souls to the beginning of a right mode of education, and to the firm establishment of such education in them. *If, however, a soul should be found in such a polity corroborated by a divine destiny, such a soul being exercised more severely in it, will become more perfect in virtue.*" ιστεον μεντοι, οτι αι μοχθηροτεραι πολιτειαι, το μεν ολον βλαβεραι των ψυχων εισιν, και μαλιστα την θειαν ελλαμψιν αναστελλουσαι, και ατιμαζουσαι τας καλλιονας επιτηδευσεις, και τα της ευζωιας παραδειγματα αφανιζουσαι. διο και προς αρχην ολως ευαγωγιας ταις ψυχαις εμποδιζουσι, και προς το πηξιν εν αυταις την ευαγωγιαν λαβειν. ει μεντοι τις εν τοιαυτῃ πολιτειᾳ ευρεθειη ψυχη, θειᾳ μοιρᾳ νενευρωμενη, ηδη αυτη σκληροτερον εν αυτῃ γυμναζομενη, τελεωτερα προς αρετην αποδεικνυται. P. 138, 4to.

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[1] In this Answer the unfaithfulness of Dr. Gillies's translation of Aristotle's Ethics is unfolded.

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[a] For περιπετασματα properly signifies *hangings, which are extended for the purpose of ornamenting some place*; and παραπετασματα properly signifies *veils*.

Another cause also, as it appears to me, of the great ignorance of the philosophy of Aristotle, which has so long prevailed, is the opinion so generally entertained by modern scholars, that no good translations can be made of his writings[3], and that, at any rate, translations of him can only be useful to those who study the original. Hence Heinsius, in the above extract, says, "That Aristotle employs a concise kind of diction, which, as it may be easily understood by one who is skilled in the Greek tongue, and who is familiar with the Aristotelian character of writing, so when it is translated into another language, is not illustrated, but rendered intricate; and together with propriety loses also its power and efficacy." I would ask the authors of this opinion, whether, when they read Aristotle in the original, they do not translate him to themselves silently: or whether reading any book in a language that is not the native tongue of the person who reads it, is any thing else than silent translation, except such language has, by custom, become as familiar to the reader of it as his native language? I would also ask them, whether they admit that the words he employs have a definite meaning? For if they have not, they are not to be understood even in Greek; and if they have they may be translated, if not literally, yet by a periphrasis. For if this is denied, Greek Lexicons, accompanied with a Latin version of the words, must be perfectly useless things; since I do not think that the authors of this strange assertion will be hardy enough to say, that Greek may be translated into Latin, but not into English, or any other modern tongue. And with respect to the assertion, that translations of Aristotle can only be useful to those who study the original, the very reverse is, in my opinion, true. For it appears to me that such translations will seldom be consulted by those who read Aristotle in the original, because most of these conceive that they can understand him sufficiently, if they are adepts in the Greek. It remains, therefore, that they will most probably be useful only, or at any rate, principally, to those who are ignorant of the Greek tongue.

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[3] Some however who are called scholars are of opinion, that Aristotle might easily be understood if he was well translated. These men conclude that this would be the case from the occasional translations of passages of Aristotle which they meet with in the writings of Mr. Harris. These passages are indeed, as I have elsewhere observed, well translated, but at the same time there is little or no difficulty in translating them, when compared with other most obscure passages, with which the acroamatical writings of Aristotle abound. It is ridiculous, therefore, this being the case, to form a judgment of the whole of Aristotle's works, from what applies only to certain parts of them.

This conceit, however, of these modern scholars seems to have originated partly from their incompetency to understand the more abstruse writings of Aristotle, and partly from a monopolizing spirit. For such is the poverty of their intellect, from being confined so long in the pale of words, that they fancy to *construe* Aristotle is the same thing as to *understand* him; and such the monopolizing nature of their ambition, that they wish to exclude all that have not the same verbal skill as themselves, from the possibility of studying his philosophy. Besides, would not any good mathematician laugh at the man who should say, that it is impossible to understand Euclid, Apollonius, and Archimedes, in any language but the Greek? For many men have become great mathematicians, who had no knowledge whatever of the Greek tongue. And as the reasoning of Aristotle, as well as that of Plato, is in his more abstruse works, universally accompanied with a scientific accuracy, and geometrical necessities, (γεωμετρικαις αναγκαις) it is no more impossible for a mind properly disposed to understand him through the medium of a good translation, than it is, through such a medium, to understand the above mentioned ancient mathematicians.

It is my firm opinion, therefore, that the Philosophy of Aristotle will never be understood, and cultivated, by any other means than a faithful Translation of his Works into some modern language, accompanied with Elucidations from the best of his Greek disciples;—and it was the same firm opinion that induced WILLIAM AND GEORGE MEREDITH, to become the patrons of the Translation which I have made of them into English. Of these very superior men, suffice it to observe, in addition to what I have elsewhere said of them[4], that few who have devoted themselves to philosophy, even in more fortunate periods, have experienced such support and protection in their pursuit of it as I have experienced for many years, from the unalterable attachment of these gentlemen. Truth, of which I profess myself to be a most ardent votary, compels me to say, that in modern times I know of no philosophic patronage which can equal what they have afforded me; and in ancient times it is perhaps only to be surpassed by that of Alexander the Great towards his illustrious preceptor. But in that instance the donor was a monarch unrivalled in magnificence and power, and the subject of his munificence was Aristotle. Whatever, therefore, may be the fate of the labours which these gentlemen have thus laudably supported, and of the author of those labours, may the sunshine of prosperity gild their days with encreasing splendour, and may their exit from life at a late period be followed by never-dying fame.

Being fully persuaded, then, that it is much more probable the Philosophy of Aristotle will be understood and cultivated, through the medium of translation, by those who have no knowledge of Greek, than by those who have, under the patronage of the above-mentioned gentlemen,

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[4] In the Introduction to my translation of Aristotle's Metaphysics, printed in the year 1801.

men, I undertook and have completed the translation of the whole of Aristotle's Works into English, to which the present volume is intended as an Introduction. For in addition to what I have already said, long experience has convinced me, that nothing in general is so prejudicial to the cultivation and strength of intellect, properly so called, as the study of foreign languages, and particularly of a language so copious and so difficult as the Greek. The Greeks themselves, those mighty masters of wisdom, were happily exempt from this drudgery; for such it must ever be deemed by a mind qualified for the reception and ardent in the pursuit of the sublimest truths; and the intellectual debility which is, for the most part, the result of the long time spent at grammar-schools and colleges, in learning nothing but the Greek language and that of the Romans, may be justly considered as not one of the smallest calamities of modern times. Hence the Greek tongue, in most instances, is studied with no other view than that of reading the Greek poets, orators, and historians; but is very rarely studied for the purpose of acquiring a knowledge of the Greek philosophy. And it not unfrequently happens, that it is studied merely for its own sake. Hence pedants, sciolists, and verbal critics, are produced in as great abundance,

> "As *half-formed insects* on the banks of Nile."

Conceiving, therefore, that I could not benefit my countrymen more proximately, and other nations more remotely, than by a translation into English of Aristotle's works, accompanied with copious elucidations from the best of his Greek disciples, I have spared no pains to make the translation as perfect as it was in my power to make it[s]. The undertaking,

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[s] I rejoice that I am able to adduce the following very respectable testimony in favour of a part of my translation of the Works of Aristotle. It is the testimony of the Rev. Mr. COPLESTON, who, for his learning and genius, is one of the greatest ornaments of the University of Oxford.

What follows then is an extract from a letter of his to me, dated Oriel College, March 8, 1811, on receiving my translation of the Rhetoric, Poetic, and Nicomachean Ethics, of Aristotle.

"The works you have selected for translation in this volume are, beyond a doubt, the *flos et medulla* of the whole; and I am in great hopes that the attention now paid to them, will impart a tincture to the philosophy and literature of the age. *For your labours every ingenuous mind must feel* ing, as must be obvious to every one who is at all acquainted with the writings of Aristotle, is arduous in the extreme. It has been the result of the incessant labour of six years; and though it was begun by me in an extremely debilitated state of body, I found, through the blessing of heaven, that I gained strength as I proceeded, that my health was renovated, and that there was nothing which an ardent mind in a noble cause could not accomplish. For the reward of such labours, I look only to the approbation of the worthy and wise. From the venal writers of the day I expect, as usual, defamation instead of thanks for

feel the highest respect; and I JOIN WITH YOU IN DENOUNCING THE ORDINARY CLASS OF CRITICS AS THE MOST DESPICABLE AND MISCHIEVOUS OF MANKIND. It is a comfort, however, to reflect that their venom has no lasting effect. The best expedient by which to oppose them is, not to read what they write *; but as few people have firmness to forbear, *it is well in the second place to remark how fugitive all their power is. The next year, and often the next month, buries them in oblivion, while the intrinsic worth of the books they calumniate is more and more discovered by time.*

" You will not expect from me any of that microscopic criticism, in which the gentry we have been speaking of delight to indulge. *I perceive in your translation, wherever I examine it, that prime virtue of a translator, a complete subordination and subserviency to his original;—no tampering with the exact meaning, in order to evade a difficulty, or to round a period. There is also a manly plainness and integrity which commands respect; and I have seen enough to convince me that a student will derive satisfaction often, from the literal rendering you have adopted.*

" The Introduction I read with peculiar attention, as also the notes on the Poetic. Nothing can be clearer, more correct, or more philosophical, than the view you give of the true nature of all the subjects of these treatises. Of dialectic in particular, it is wonderful how erroneous and confused the opinions of men in the present day are.

" Let me also add, that your explanation of the celebrated definition of tragedy strikes me as no less just than ingenious. Twining is ingenious; but after all his diffuse dissertation, I used to feel dissatisfied. You have, I think, offered an admirable solution, although a little difficulty still hangs about the word *τοιουτων*. Your sense, however, I adopt as the best which has ever been proposed."

As I have taken the same pains in translating all the other volumes of Aristotle's works as in that above-mentioned, I trust that Mr. Copleston, if he had compared them with the original, would have given a similar testimony of the faithfulness of my translation. Indeed, I have endeavoured to give the most literal version possible of the text of Aristotle, well knowing that from the extreme accuracy of his diction, and profundity of his conceptions, it is scarcely safe to omit a word of what he has said; and, therefore, when I have found it necessary to add something, in order to render him legible, I have inserted in brackets what I have added.

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* This expedient I have always adopted, except in one instance, when I deemed it proper to expose their ignorance and malevolence, which I have done at the end of my translation of Proclus on Euclid; and I shall again read them, should it ever appear to me to be requisite to do so. But whenever this happens, they shall find, in the language of Junius, " that all I have as yet said of them is but lenity and compassion."

what I have done, a minute detail of the errors[6] I may have committed, a wilful misrepresentation of what I have said, a malevolent insinuation that I am incompetent to the task I have undertaken; and, in short, as I have elsewhere expressed it, from these men I expect whatever the hatred of envy can administer to the purposes of detraction, or the cunning of malignant sophistry can pervert. But I have been too long disciplined in the schools of Plato and Aristotle either to court the praise, or to dread the censure, of such men as these; of men who are influenced by gain, and court the applause of the rabble in what they write; and whom

Laws divine or human fail to move,
Or shame of men, or dread of gods above[7].
Heedless alike of infamy or praise,
Or fame's eternal voice in future days.

The impotence of the malevolence of these men with respect to myself, is remarkably conspicuous. For having for the space of thirty years made the study of the philosophy of Plato and Aristotle, the principal, though, from necessity, not the sole object of my pursuit, I determined, from a deep conviction of its intrinsic excellence, and of the inestimable benefit which must result from a legitimate study of it, to promulgate it to the utmost extent of my power; and Providence, in a manner almost miraculous, has co-operated with my endeavours. For though I have met with nothing but opposition from the above-mentioned writers, and others whose works are applauded by the multitude[8], yet I have obtained patronage in my efforts to promulgate this philosophy,

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[6] It is well observed by Aristotle in his Great Ethics, lib. 2, cap. 7, "That as it is not proper to form a judgment of a statuary from the errors which he has committed, and the works which he has badly executed, but from the works which he has executed well; thus also, neither is a judgment to be formed of the quality of science, or nature, *or of any thing else*, from depraved, but from good things." *ωσπερ γαρ ουδ᾽ ανδριαντοποιον θεωρειν δει ποιος τις εστιν εξ ων απετυχε, και κακως ειργασατο, αλλ᾽ εξ ων ευ· ουτως ουδ᾽ επιστημην ουδε φυσιν ουδε αλλο ουδεν ποιον τι εστιν εκ των φαυλων, αλλ᾽ εκ των σπουδαιων.* This mode of conduct, however, which Aristotle justly reprobates, has been, I am told, uniformly adopted by these men towards my writings. For they have omitted to notice either the magnitude of what I have done, or the object of all my literary labours, viz. the dissemination of what I conceive to be the highest truth and virtue; or the information with which my works abound on the most important philosophical subjects, and which is not elsewhere to be found in any language but the Greek; or my development of the doctrines of Plato and Aristotle. I can excuse them, indeed, for omitting to notice the two last of these particulars, from their perfect ignorance of such information and such doctrines. For how is it possible that the arduous sublimities of genuine philosophy can be apprehended by those who are engaged in the low drudgery of sordid emolument? I am also informed that the Critic who has defamed me in one of the most popular Reviews, is the very same iotal divine who asserted in a public lecture On Beauty, with the most unblushing effrontery, "that the perfect was not the beautiful, and therefore PERFECT JUSTICE WAS NOT BEAUTIFUL!!!" Homer, as I have elsewhere observed, in his Battle of the Frogs and Mice, doubtless intended to satyrize two classes of verbal critics, by whom he had probably been abused, the one *clamorous*, and the other *insidious*, and who, as is generally the case with these *vermin*, at length attacked each other.

[7] Pope's Odyssey, book 24, line 47, &c. One of these miscreants (I thus denominate them, not

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not for their malevolence towards me, but towards the philosophy of Plato and Aristotle) in the Monthly Review, takes occasion, (I am told) in reviewing the translation of the Paraphrase of an anonymous Greek writer on the Nicomachean Ethics of Aristotle, by Mr. Bridgman, to defame me, because Mr. B., in the preface, had, from motives of gratitude, acknowledged that he derived considerable assistance from me, in the translation of that work. And this reviewer begins with saying, "We boded no good of the present performance, when we saw the name of Mr. Thomas Taylor in the writer's preface." See the malevolence, ignorance, and pride of these Monthly Reviewers fully exposed at the end of my translation of Proclus on Euclid. Another review, however, (I believe the Critical, for I speak from the information of others, as I never read such trash) speaks handsomely of this translation of Mr. Bridgman, though my name is mentioned in the preface to it. I am further informed, that this Monthly Reviewer adds, "We repeat that we regarded the name of this gentleman, and the honourable mention with which it is introduced, as rather alarming omens." I have no doubt he did, and I trust my name will always be an alarming omen to the stupid, the malevolent, and the worthless;—that it will always be an omen of unceasing hostility, and the most strenuous exertions against folly and vice, and against illiberal criticism and venal defamation. For of all the species of traffic with which this island abounds, that of reviewing books, as it is at present conducted, is the most illiberal, as well as the most tyrannical. It is most illiberal, because it is undertaken from sordid motives; and it is most tyrannical, because it becomes the means of subjugating the opinion of the multitude to the decision of an obscure and worthless few.

[8] Dr. Gillies, speaking of me in the Supplement of his New Analysis of Aristotle's works, observes, "If that translator of the Metaphysics had been as skilful in Greek as *he is profound in philosophy*, he would not have recommended, as essential to the right understanding of Aristotle, the Commentary of Alexander Aphrodisiensis. Alexander's Commentary on the Metaphysics now exists only in a Latin version, and cannot, therefore, afford much assistance to a man capable of reading the Greek original, and who wishes to convey its sense clearly to his countrymen in their native tongue." On this observation, in my answer to the Supplement of the Dr., I remark as follows: "I am very much mistaken if there is not as much nonsense in this passage as malevolence.

philosophy, the most noble, and the most liberal. I have lived to see my earlier productions become scarce, and sell for more than their original price. I have been enabled to do that which no man in modern times has done, to give the Works both of Plato and Aristotle in my native tongue; to bring to light truths which have been concealed for more than a thousand years; to unfold the theology and mythology of the Greeks from the most ancient and genuine sources; and to elucidate from the same sources all the sublime and most important dogmas of Plato and Aristotle. Having done all this, and I defy any of my enemies to prove that I have not, I have lived to accomplish what I wished to accomplish, the publication of doctrines the most exalted and the most beneficial that were ever imparted by Divinity to man; and in consequence of this, whenever I die, I shall die with the pleasing consciousness, that I have done that which is neither contemptible nor small.

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volence. For can any thing be more absurd than to assert, that the Commentary of Alexander cannot afford much assistance to a man capable of reading the Greek original of Aristotle, because it now exists only in a Latin version? When at the same time Alexander was one of the most famous of Aristotle's interpreters. And can any thing be more malevolent than the insinuation, that I am not skilful in Greek, because I availed myself of the assistance of this Commentary in a Latin translation, not being able to consult the original because it is lost? Is it possible, likewise, that there can be a greater contradiction in terms, than to suspect my knowledge of Greek, and yet confess that I am profound in philosophy? For if I am profound in philosophy, it must be in that of Plato and Aristotle, since I have studied and profess no other. How then did I acquire my profundity? For, exclusive of my own translations, there is no English translation of any part of Aristotle's works, except his Poetic, Rhetoric, and Politics, nor of the more abstruse of Plato's writings: and the Dr. observes, in the paragraph above quoted, " That Latin translations from the Greek are seldom intelligible, except where their assistance is superfluous to a Greek scholar. As I have, therefore, no knowledge whatever of any languages but English, Latin, and Greek, it is evident that this profundity must have been obtained from the Greek. And thus the malevolent insinuation of Dr. Gillies confutes itself, and is as imbecile as his answers to my strictures, and his abuse of the Platonic philosophers."

An ADDITIONAL NOTE to p. 48.

CONCERNING THE DOCTRINE OF PARMENIDES, FROM THE COMMENTARIES OF SIMPLICIUS ON THE PHYSICS OF ARISTOTLE.

"SINCE," says Simplicius, "we have arrived at the end of the arguments against Parmenides, it will be well to investigate the opinion of Parmenides himself, about the one being, as commensurate to our purpose, and to consider on what account Aristotle's contradictions of his doctrines were adduced. That Parmenides, therefore, did not admit the one being to be any thing which can be generated and corrupted, is evident from his assertion that the one is unbegotten and incorruptible. Nor, in short, does he admit, that the one being is corporeal, since he says it is indivisible. Hence, neither can what he says accord with the heavens, as some, according to Eudemus, conceived it did, in consequence of this line of Parmenides,

> Throughout resembling a revolving sphere.

For the heavens are not indivisible, nor a similar sphere, though they are the most accurate of all natural spheres. That Parmenides also did not consider the one being as psychical, or belonging to soul, is evident from his calling it immoveable, as when he says,

> The one immoveable has every name.

For the psychical essence, according to the Eleatic philosophers, possesses motion. He also says, that being is all things at once,

> . . . . Since now 'tis all at once.

Also that it subsists according to the same, and after a similar manner,

> Same in the same, and by itself abides.

And it is evident, that according to essence, power, and energy, it possesses the all at once, and sameness of subsistence; which are properties beyond the essence of soul. May we not also assert, that neither does Parmenides say, that the one being is intellectual? For the intellectual subsists according to separation from the intelligible, and a conversion to the intelligible. But in the one being, he says, that intellectual perception and the intelligible are the same: for thus he writes:

> Perception intellectual is the same
> With that for which intelligence subsists.

He adds, "for they are not without being," i. e. the intelligible,

> In which perception mental you will find.

Again, the intellectual is separated into forms, just as the intelligible unitedly comprehends, according to cause, the separation of forms. But where separation is, there difference is: and this subsisting*, non-being also presents itself to the view. Parmenides, however, entirely exterminates non-being from being:

> Non-being ne'er, and in no mode subsists,
> But there thy intellectual notions check
> When in this path exploring......

Nor did he conceive the one being to be something which is common; neither that common something which is of posterior origin, subsisting by ablation in our conceptions; since a thing of this kind is neither unbegotten, nor indestructible; nor that which is in things themselves; for this is sensible, and belongs to objects of opinion, and things of a deceitful nature, about which he afterwards speaks. For how could it be true to say of this, that "it is now the whole at once," or that

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* Hence Plato, in the Sophista, considers *difference*, one of the five genera of being, to be non-being. But the five genera of being, of which difference is one, are, *essence*, *motion*, *permanency*, *sameness*, and *difference*.

" it contracts in itself intellect and the intelligible?" Does he, therefore, say, that the one being is an individual essence: or is not this very dissonant from the one being? For an individual essence is generated, is divided by difference, and is material and sensible, and different from accident. It is also divisible, and in motion. It remains, therefore, that the one being of Parmenides, is the intelligible cause of all things, through which intellect and intellectual perception subsist, and in which all things are comprehended according to one union, contractedly, and unitedly: in which also there is one nature of the one and being. Hence Zeno said, "If any one should demonstrate the one itself, he would unfold being." He did not, however, say this as denying the subsistence of *the one*, but in consequence of *the one* subsisting together with being. But to this one being, all the above-mentioned conclusions are adapted: for it is unbegotten, indestructible, entire, and only-begotten; since it will not be second to any other, as being prior to all separation. To this also, the collective all, or an all subsisting at once, pertains; and likewise the assertion that non-being has no place in it. Farther still, the indivisible, and the immoveable, according to every species of division and motion, and invariable subsistence, accord with this one being. Likewise end; for this is the end of all things. And if this is that for the sake of which intellectual perception subsists, it is evidently the intelligible; for intellectual perception and intellect are for the sake of the intelligible. If also intellectual perception and the intelligible are the same in it, the transcendency of its union will be ineffable. And that I may not appear to say this without sufficient authority, I will add the verses of Parmenides concerning the one being, in order to give credibility to my assertions, and because the writings of Parmenides are rare. They are, then, as follow;

This truth alone it now remains to tell,
That in this path *one being* we shall find,
As numerous tokens manifestly show;
And these its characters: without decay,
And unbegotten, stable, without end,
Only-begotten, whole; nor once it was,
Nor will hereafter be, since now 'tis all,
At once collected, a continued one.
For whence its source, or growth, would you explore?
Not from non-being, which nor mind can see,
Nor speech reveal; since as of being void
'Tis not an object of the mental eye.

But as from no one it derived its birth,
Say, why in time posterior it began
Rather than in some prior time, to be?
Thus must it wholly be, or wholly not.
For never will the power of faith permit
That aught should ever into being rise,
Without subsisting for the sake of this:
Nor will the goddess, Justice, with her bonds
Encircling all, e'er suffer without this
Aught to be generated, or to be no more.

* * *

Next, what is being? How was it produc'd?
If generated, 'tis not; and if once it was,
Then in some future time 'twill cease to be.
Hence generation is to this unknown,
And void of faith, corruption; nor can it e'er
Divided be, since similar the whole.
Nothing than this is greater, nor a part
Is found in this inferior to the whole.
But all with being is replete, through which
All is continued; since to being here
Being approximates; but in the bounds
Of mighty bonds, immoveable it lies,
Without beginning, and with ceaseless power.
For generation in these lower realms,
Leagu'd with corruption, wand'ring wide are seen,
And faithful truth is now here to be found.
Same in the same and by itself abides,
So firm it there remains, held in the bonds
Of bound, by strong necessity, on every side.
Unlawful, hence, that being without bound
Should e'er remain; for want it never knows.
But to non-being perfect want belongs.
Perception intellectual is the same
With that for which intelligence subsists;
For without being never can be found
Mental conception; since 'tis truly said,
In being, intellectual vision dwells.
Nor is there now, or will hereafter be,
Aught besides being, e'en tho' time exist,

Since Fate immoveable the whole has bound,
Which ev'ry name, by mortals fashioned, claims.

* * *

On all sides like a sphere's revolving bulk,
And from the middle equal every way.
For nothing it is fit should greater be
Or less, in aught that being comprehends.
Since it is not of being void, that e'er
To sameness it should cease at length t' arrive.
Nor is it partially with being fill'd,
Of this a void possessing more and less;
But safe and undefil'd in ev'ry part,
The whole is one inviolable all.
For equal every way, in bounds it reigns.
Here about truth firm thoughts and reasonings end:
Opinions human now attentive learn,
Cloth'd in fallacious ornament of words.

These then are the verses of Parmenides about the one being; after which he speaks about objects of opinion, adopting in them other principles, which Aristotle mentions in what follows, saying, "For Parmenides makes the hot and the cold to be principles, and these he denominates fire and earth." But if Parmenides says, that the one being is similar to the bulk of a revolving sphere, we must not wonder; for through his poetry he employs a certain mythological fiction. What does it differ, therefore, to assert this, or to say with Orpheus, that being is of a white texture? And it is evident that some of the assertions of Parmenides entirely accord with other things posterior to the one being. Thus the unbegotten and the indestructible pertain both to soul and to intellect; and the immoveable and abiding in the same, to intellect. But all of them, collectively and genuinely considered, are adapted to the one being: for, according to a certain signification, soul and intellect are unbegotten, but they are produced by the intelligible. The one being also possesses the immoveable peculiarity, in which, motion according to energy has not a separate subsistence. The abiding in sameness likewise properly belongs to this; but soul and much-honoured intellect proceed from that which abides, and are converted to it. It is also evident, that such things as are said to subsist in the one being, are comprehended in it unitedly, but proceed from it with separation. And it appears, indeed, to be delivered by Parmenides as the first cause, if it is one collected all, and the ultimate bound. If, however, he does not simply call it one, but one being, and only-begotten, and bound but finite, perhaps he indicates that the ineffable cause of all is established above it. How, therefore, do Plato and Aristotle appear to contradict Parmenides? Plato, indeed, contradicts him in a twofold respect, both from his calling being the one, and perfectly taking away non-being from the intellectual and separated worlds, in which being is divided from the one (so that both do not remain one), and the parts from the whole: for, from hence, Plato shows that beings are not one, but more than one. But he demonstrates non-being from the difference which subsists in separated forms; through which the being that is there, considered according to one peculiarity, is not motion or permanency, and each of the rest is what it is, but *is not* other things. And it is evident, that non-being is entirely there, where separation and difference* are unfolded into light; in intellectual natures, indeed, according to form, but in sensibles according to interval and division. But this non-being Parmenides also himself appears to admit in objects of opinion, since he calls the ornament of his verses, about mortal opinions, fallacious: for, where deception is, there also is non-being; since he is deceived who thinks that non-being is, or that being is not. Hence, not only Parmenides, but likewise Plato, subverts the existence of perfect non-entity, who also avoids the investigation of it; for he says, "Let no one, therefore, say, that we, having shown that non-being is contrary to being, dare to assert that it is; for we have sometime since bid farewell to the consideration of that which is contrary to it, whether it is reasonable or perfectly irrational that it should be or not. But that which we now assert to be non-being, either some one, confuting, should persuade us that it is not properly denominated by us; or, so far as he is incapable of confuting us, so far he should assent to what we say." And, indeed, it is not at all wonderful that in being of this kind, which is defined according to one peculiarity, Plato should demonstrate such a kind of non-being; at the same time that in the intelligible, which is perfect, entire, and unitedly all things prior to all, non-being of this kind has no place whatever. But Aristotle, adducing the contradiction from division, says, that being is either predicated in many ways, and thus there will be many beings, or in one way only; and thus it will either be essence or accident. And it is evident, that no one of these belongs to the intelligible; since this division becomes apparent in generation; and prior to generation subsists according to cause in intellectual separation. But let no one blame Plato and

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* Separation and difference are perfectly unfolded into light according to form, in the extremity of the intellectual order. See the Notes on the first and second hypothesis of the Parmenides of Plato, in my translation of that dialogue.

Aristotle for contradicting Parmenides on account of other causes: for they benevolently repress the interpretations of superficial readers. That they conceived, indeed, Parmenides to be a wise man, is evident from hence, that Plato testifies the profundity of his mind to be perfectly generous, and introduces him as the preceptor of Socrates in the highest disciplines. And Aristotle, suspecting him to look elsewhere than to physics, classes him in contradistinction to physiologists. Plato, also, in the Parmenides, delivers *this one*, and celebrates its transcendency. And Aristotle in his Metaphysics, contending that the cause of all is one, exclaiming that the domination of many is not good, and celebrating the union of this cause, very properly there surveys as the same, intellect and the intelligible, essence, power, and energy. But enough of these things, lest, according to the proverb, we should appear to leap beyond the prescribed limits, inserting, in a physical treatise, theological sublimities.

FINIS.

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